AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

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Contents

Use of More Finance Paper Expected in '31. By Don Blanchard 781
Keeping Step With Diesel Engine Developments 784
Trim Shop is Automatically Scheduled to Fit Progress of Assembly Line. By J. Geschelin.. 788
If I Were an Engineer Today—Fredrick E. Moskovics 795
Just Among Ourselves 797
More Power in the New Hudson and Essex Lines 798
Books for the Business Bookshelf 801
How's Business Going to be Next Month? 802
White Presents Six-Wheel Line With Four Models 803
New Developments 804
Automotive Oddities 806
News of the Industry 807
Financial Notes 808
Production Index 809
Men of the Industry 810
Calendar of Events 816
Advertisers' Index 88-89

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1931

An Opportunity and Responsibility

ONLY one more month of this year remains . . . for planning how to cut costs in 1931. So, there is no time to lose. Tackle this problem NOW.

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A telephone call or telegram will bring full information . . . or one or a carload of die sets, should you need them. The Danly assembly plants listed below are at your service. Your die sets are ready, in stock, right now! Danly can serve you well in vital ways, during 1931. Until you use Danly Service you have not cut costs as much as you could, nor eliminated much unnecessary detail and delay.

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Vice-President

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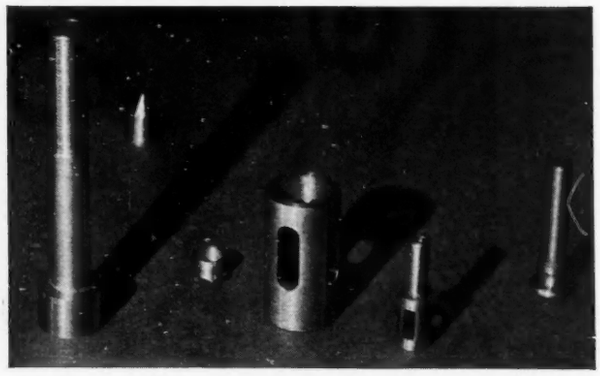

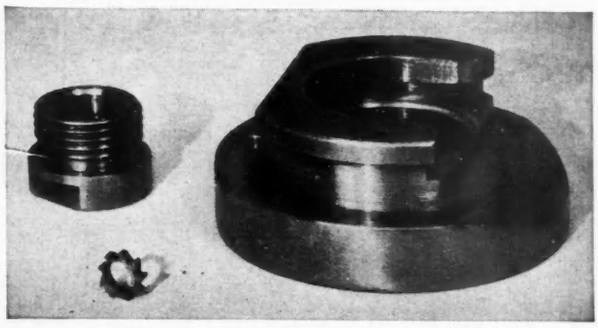

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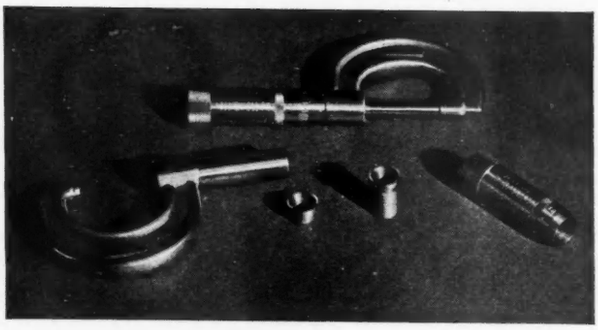

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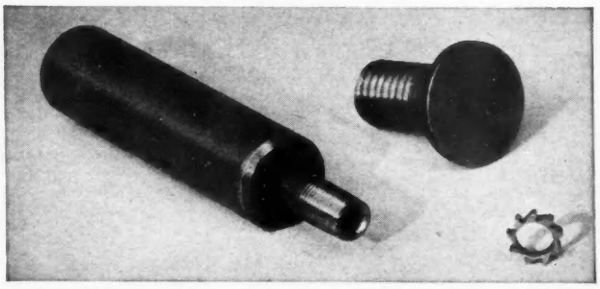

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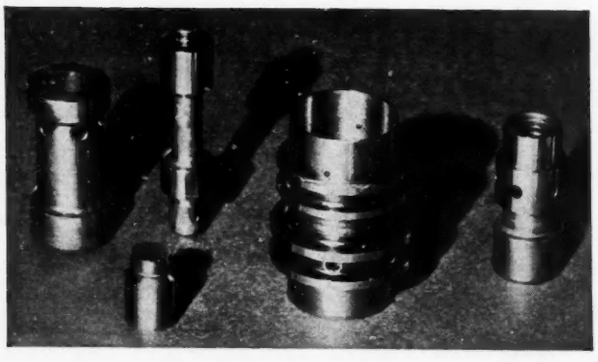

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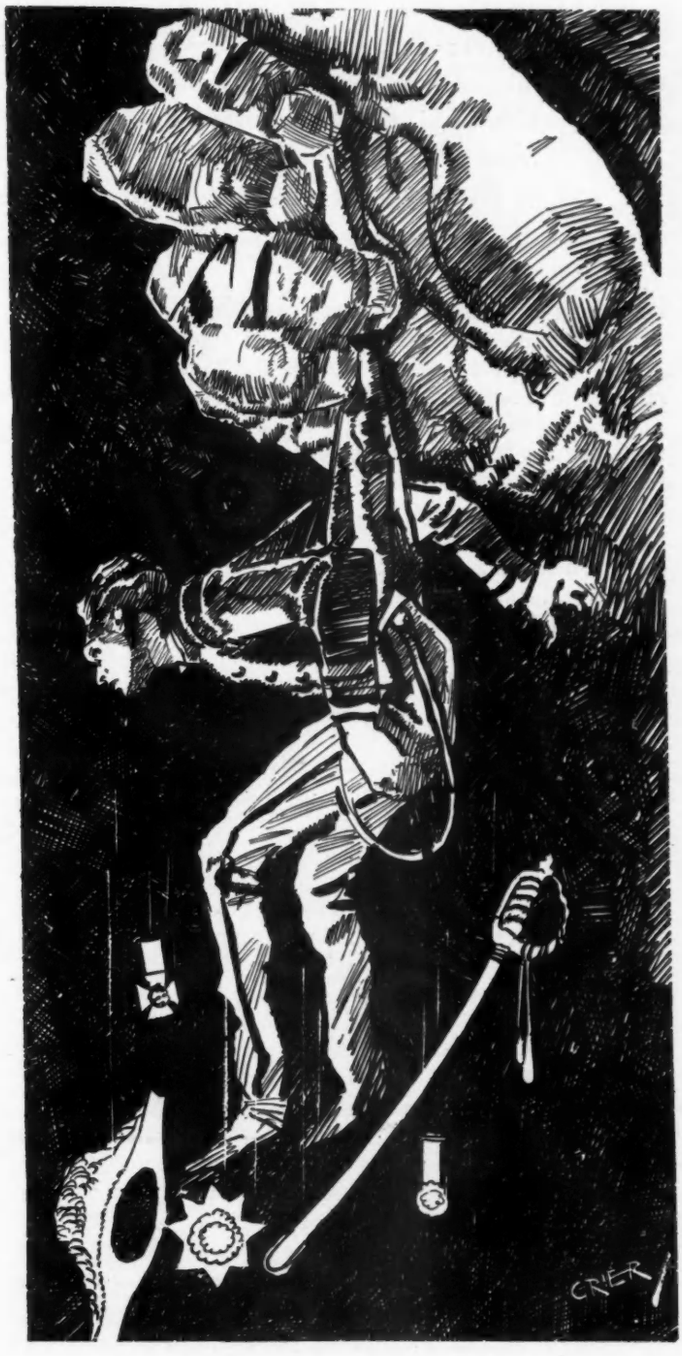
Use of More Finance Paper Expected in '31

by Don Blanchard



The finance companies regard rehabilitation of the automobile dealer as of primary concern + +

THAT a moderate increase in the volume of automobile paper is in prospect for 1931 appeared to be the consensus of opinion among finance company executives who gathered in Chicago last week for the annual convention of the National Association of Finance Companies. General sentiment on the outlook seemed to be well summarized in the forecast made by Milan V. Ayres, association analyst. He predicted for 1931:

1. A 10 per cent gain in new car paper;
2. A 15 per cent gain in used car paper;
3. Resulting in a 12 per cent gain in total retail financing.

So far as figures for this year's operations are available, they show a 22 per cent decline from 1929 in the dollar volume of retail automobile paper. While this loss is smaller than the drop in new car sales, it is, nevertheless, a severe shrinkage and one which has served materially to intensify the competition for automobile paper. The most serious result of this more intense competition has been an increase in repossession losses, particularly on used cars, for some companies at least. Another effect has been a 6 per cent increase in wholesale financing, which is less profitable than retail paper.

The net result of these various factors, as might be expected in a year like 1930, has been smaller profits. But despite the difficulties with which finance companies have

Cause and Effect?

Victor L. Brown, president of the N.A.F.C., suggested downward revision of wholesale financing rates at last week's convention in Chicago. This week's news discloses that the General Motors Acceptance Corp. has put into effect the suggested revision. G.M.A.C. service charges now range from a flat $2.50 per car for Chevrolets to $5 per car for Cadillacs.

contended this year, they have weathered the storm better than most other lines of business and thus have provided further evidence of the soundness of this method of extending credit.

While unemployment is regarded as primarily responsible for the increase in repossession losses, laxity in granting credit also has been a factor of some importance. Apparently, in the earlier months of this, dealers with a questionable piece of paper in many cases did not find it hard to locate a finance company who would take it. The inevitable result of such departures from sound credit policies has been repossession losses. Recently, it is understood, that there has been a general tightening up in this respect.

In addition, there has been some tendency to buy paper representing more than a proper percentage of the car offered at security. Moreover, down payments haven't always been what they seemed to be. This is particularly true where a used car figured as a part of the down payment. In such cases, dealers have not infrequently inflated the used car allowance to the point that, taken with the customer's available cash, the total represented technically a proper down payment. To meet these evils it was urged that finance companies check not only the used car being financed against the red or blue book, but also to secure a description of the car traded in so that its value also could be checked.

Apparently in recognition of these conditions the convention adopted resolutions, one of which restated and ratified the standard terms adopted some years ago. Another emphasized the necessity for verifying the value of financed used cars and concluded with the statement that "in used car transactions the amount of the instalment note should not exceed blue book or red book U. S. average appraised value."

Finance Companies Supplant Bank Service

This year's increase in wholesale financing is, of course, mainly the result of the banks having withdrawn much of their direct support of the automobile dealer. It is also, however, another effect of this year's more intense competition for finance business. Wholesale financing is less profitable than retail paper, but it represents an added service the finance companies can offer to their customers. Hence it is a competitive weapon of some importance.

Wholesale financing is going to continue to be the important feature of the finance business that it has been this year, in the opinion of Victor L. Brown, president of the association. He said that the banks did not have the necessary machinery to check dealer inventories and thus to safeguard their loans. At present wholesale financing costs the dealer about current interest rates and in no case more than maximum legal interest, but Mr. Brown voiced the opinion that at current rates it did not yield satisfactory profit. In view of the fact that wholesale seems destined to represent an increasing proportion of finance company volume, he suggested that a revision of rates should be considered and also urged that floor-planned cars be checked vigilantly to guard against conversion. It was evident throughout the sessions of the convention that the finance companies regard rehabilitation of the automobile dealer as one of their primary concerns. The high rate of turnover among dealers and the feeble financial position of so many of them combine to make a clientele lacking in the stability that is desirable for satisfactory business relations.

Because of this concern about the automobile dealer, the convention listened with unusual interest to Studebaker vice-president, Paul G. Hoffman, who talked on future selling of cars. Mr. Hoffman said that in the last five years dealers had sold $15,000,000,000 worth of new cars on which they should have earned $750,000,000 net profits. Actually, however, they probably didn't retain as net profits more than $250,000,000 on this volume. He stated the problem facing the industry was how the situation could be worked out so that dealers would show a very much greater profit retention on the $18,000,000,000 of new cars they would sell in the next five years.

Profit Retention of Car Dealer Small

In analyzing the reason for low profit retention by dealers he listed (1) Undue forcing of new cars by factories; (2) Over-liberal extension of credit; (3) Lack of capital; (4) Lack of proper conception by dealers of retailing organization; (5) Inefficiency of dealer marketing effort; (6) Lack of inventory control by dealer; (7) Lack of expense control by dealer.

The first two of these points should cause little concern because the memory of their adverse effects is too fresh to permit a recurrence. Lack of capital is correcting itself as, for some time the attitude of the banks has been to discourage a prospective dealer so that, if he has gone into the business, he has to have the necessary capital.

The last four points all have to do with the dealer's operating practices, and Mr. Hoffman bespoke the cooperation of the finance companies in putting over the programs designed to increase the dealer's selling and operating efficiency, which leading factories have inaugurated.

Coercion of dealers to use factory-owned or approved

finance companies and non-recourse vs. recourse or repurchase again were discussed, as they always are at the association's conventions. No new arguments were developed either way.

However, a representative of a non-recourse company described a wage assignment which he had put in his contract and which has worked very successfully. He has found it to be an effective club to force the payment of a debt, as with it the debtor can't consider that allowing his car to be repossessed washed up his responsibility. He is still responsible for any deficiency remaining after the car is sold and and his wages may be taken to cover such deficiency. In practice, the debtor almost always prefers some settlement rather than to lose his wages until after the debt is paid.

It also developed that some companies are considering offering their services direct to the public instead of through the intermediary of the automobile dealer. In this way it might be possible for them to get around whatever pressure the factory brings on the automobile dealer and it would also remove a link from the chain—the automobile dealer—who has not always proved responsible. One means of establishing the necessary contact with the public which was suggested was through an automobile loan department. Customers of this department, as a result of services rendered, might be induced to deal direct next time they bought cars.

The accompanying table was part of the address made by Milan V. Ayres, previously referred to. It reflects the large increase in used car and wholesale financing. However, it does not in Mr. Ayres' opinion indicate that a larger percentage of this year's sales have been on time payments as a cursory inspection might lead one to believe. Rather, it indicates that the finance companies are getting a larger proportion of the total finance business than heretofore, and that banks, dealers, etc., are handling less.

Finance Company Getting a Larger Proportion of Business

	1930 as Per Cent of 1929*	1930 as Per Cent of 1928*
New cars registered	71	96
New cars financed	76	115
Used cars financed	101	155
Retail dollar volume	78	113
Wholesale dollar volume	106	...

*Comparisons are based on figures for the first eight months of each year.

The recent decision of the United States Supreme Court regarding cars confiscated for transporting liquor does not entirely clear the air. This decision said that, where transportation is shown, prosecution must be brought under the National prohibition act, in which case the innocent lienor is protected. The Department of Justice has taken the stand that this decision does not cover cases where transportation is not shown, as when the car containing liquor is abandoned and, in such cases, are seizing under the Internal Revenue laws which do not protect the lienor. If smuggling is involved, seizure is made under the Customs act, which also fails to provide protection for the innocent lienor. To clear this situation up, it seems quite likely that Congress will have to pass legislation defining the procedure to be followed.

The convention again went on record as favoring a change in Federal Reserve regulations which would make finance company paper eligible for rediscount.

Victor L. Brown, president of the Motors Acceptance Co., Milwaukee, was reelected president of the association.

World Benzol Production

DURING 1929 the production of benzol was 560,000 tons in the United States, 370,000 tons in Germany, 150,000 tons in England, 80,000 tons in France, $35,000 tons in the Saar district, 33,000 tons in Belgium, 30,000 tons in Czechoslovakia, 20,000 tons in Poland, and Holland each, and 5000 tons in Spain and Italy. The world's production thus exceeded 1,300,000 tons.

Germany is a large consumer of benzol, for in addition to the 370,000 tons which it produced in 1929 it imported 165,000 tons of this hydrocarbon. The United States exported some 90,000 tons last year, of which 62,000 were shipped to Germany, 22,000 tons to England and 12,000 tons to France.

France in 1929 consumed 65,000 tons of benzol as motor fuel, as compared with 1,600,000 tons of gasoline and 15,000 tons of alcohol. Thus benzol constitutes about 3.9 per cent of the motor fuel consumed in France. This figure is comparable to that for England but considerably smaller than the corresponding figure for Germany.

THE number of motor vehicles in use in the German Republic on July 1, 1930, included approximately 501,000 passenger cars, 157,000 motor trucks and 731,000 motorcycles. The three classes showed gains during the year of 15.7, 9.4 and 20.2 per cent respectively. Taking all classes of motor vehicles and cycles together the increase during the past year was 16.6 per cent, as compared with 30.1 per cent the previous year.

In Step With Diesel Engine Developments

Radial Engine With Decompression Oil-Drain Developed by Clerget

DIESEL automotive engines have been commanding a great deal of interest in recent months. In this description of the French Clerget Diesel nine-cylinder radial airplane powerplant and the Hill Diesel for trucks and buses, two of the most recent developments, Automotive Industries inaugurates a series of six articles covering the present and future development of high-speed Diesel engines.

Aircraft engines working on the Diesel principle have now been developed in this country, in England, France, Germany and Italy.

England has the Beardmore engine, specially designed for lighter-than-air craft. Germany has the Junkers two-stroke type with two pistons in each cylinder. In Italy, Fiat has converted a stock carburetor-type aircraft engine into an oil-burning engine with the aid of Bosch equipment.

The second of the series will appear in our issue of Dec. 6. In this Dr. P. H. Schweitzer discusses the "Present Limits of Performance of Automotive Diesel Engines."

The third article will be written by M. W. Bourdon, describing a high-speed six-cylinder Diesel engine, developed for the London General Omnibus Co.

The fourth article of the series presents the Diesel problem from the fuel angle.

The fifth and final article of the group is a survey of fuel injection practices and developments.

A DIESEL-TYPE aircraft engine with air-cooled radial cylinders has been under development for a considerable time by Clerget in France. The first engine built has a rating of 100 hp. at 1900 r.p.m. and comprises nine cylinders of 4.72 in. bore by 5.12 in. stroke. Its weight is 462 lb., or slightly over 3 lb. per horsepower. Several flights have been made with one of these engines and five of them are said to be in production at present. A 200 hp. engine also has been completed and in its designs use was made of the experience gained with the smaller model. The larger engine also has nine cylinders, the bore and stroke being 5.12 and 6.69 in. respectively. This engine weighs a trifle less than 3½ lb. per horsepower. Its idling speed is only 450 r.p.m., in which respect it compares favorably with gasoline engines.

The crankcase is made from a steel forging without welding, and the steel cylinders, which have the cooling fins turned on, are secured to the crankcase by means of square threads and check nuts. Inlet and exhaust valve seats and passages are formed in a cast aluminum cylinder head which is secured to the cylinder by four studs, the fuel injector being located at the center of the head between the air valve and the exhaust valve.

One of the features of the engine is a decompression and oil-drain valve. When getting ready to start the engine, all of the exhaust valves are raised off their seats simultaneously by means of a suitable mechanism by the pilot. The exhaust valves are not located in the same position in all of the cylinders, each being at the lowest part of the compression chamber, so that when they are raised, any oil which may have accumulated in the compression chamber (and

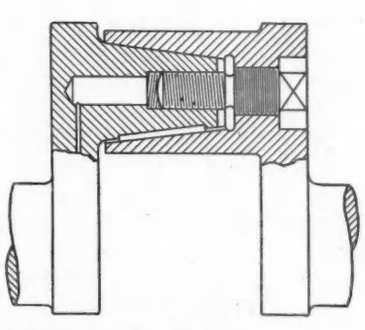


Fig. 1—Joint between halves of crankshaft

Feature and Cylinder

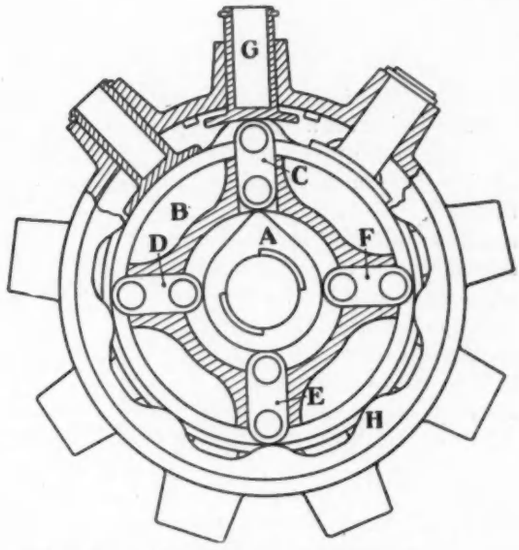


Fig. 3 — Method of operating nine fuel pumps by cam on crankshaft

A, cam; B, ring containing tappet guides; C, D, E, F, tappets; G, pump plunger; H, tappet-return cam

which, on account of the high compression ratio used, might influence the volume of that chamber materially) is drained off. Decompression, of course, also facilitates starting, which is effected by means of a rubber cord portable starter. The engine is stopped by pressing on the "decompressor," thereby lifting the exhaust valves off their seats.

Pistons are of aluminum alloy, with four compression and one scraper ring each, and piston pins are of the floating type. The piston head is hemispherical and it appears that the edge of the head comes close up to the cylinder head. This form of combustion chamber is claimed to give sufficient turbulence, and the fact that at the beginning of the power stroke the charge is not in contact with the cylinder walls is said to result in good, clean combustion.

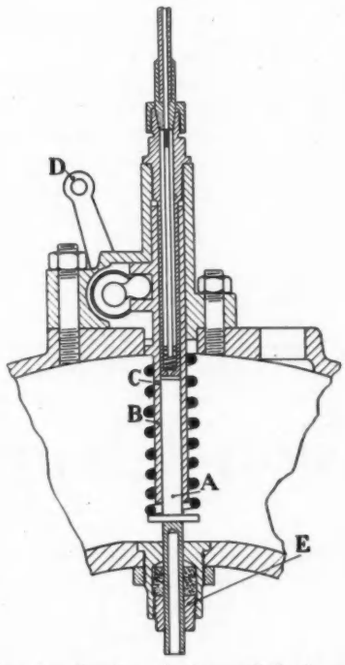


Fig. 2—Sectional view of fuel pump

A, pump plunger; B, pump barrel; C, inlet port; D, control lever; E, stuffing box

The crankshaft is "built up," there being a conical keyed joint within the crankpin, the two halves being drawn together by means of a screw with differential threads. An advantage of this construction is that when disassembling the crankshaft, turning of the screw in the counter-clockwise direction forces the two parts of the crankshaft apart. An I-section master connecting rod is used in conjunction with round-section articulated rods. Valve rods are located on the propeller or forward side of the engine, the fuel pumps at the rear.

A separate injection pump is provided for each cylinder. The pumps are located in the crankcase parallel with the respective cylinders, their outer ends projecting from the case. Fuel is conducted from the pump to the injection valve through an outside tube of soft copper of such dimensions that it will stand pressures up to 14,000 lb. per sq. in. If higher pressures are attained, the tube will burst and thus protect more important parts. A second tube, also of red copper, carries the oil seepage back from the injector to the supply in which the inlets of the pumps are submerged.

All of the pumps are operated by a single cam which is mounted on a helical spline on the crankshaft so that the time of injection can be varied by shifting it in the axial direction. The cam does not contact directly with the pump plungers, but with tappets located in guides in a housing rotating in opposition to the crankshaft at one-eighth crankshaft speed. There are four tappets in the housing, and if the latter were stationary the cam nose would sweep by eight tappets in two crankshaft revolutions; since the tappet housing revolves in the reverse direction at one-eighth crankshaft speed, the cam sweeps by nine tappets and consequently produces nine injections during two crankshaft revolutions—one per cylinder. The pump plungers have a segment-shaped foot, so that they can be acted on properly by the tappet, although the latter is shifted angularly for injection timing. Tappets are normally returned by the pump springs, but in case any of these should break, the return stroke would be effected by a stationary cam ring.

Claims made for the use of a single cam are that it insures uniformity of charge distribution to all cylinders; rapid injection without too steep a cam incline, and independence of the injection rate of timing.

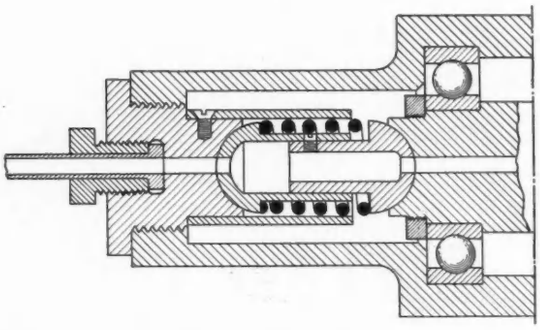


Fig. 4—Oil connection to drilled crankshaft

The injection pumps are completely surrounded by fuel in a chamber through which continuous circulation is maintained by means of a small gear pump. This circulation of the fuel assures its deaeration. The fuel is circulated through a filter and returns to the tank through a sight glass.

The injector pump is of the plunger type with fixed length of stroke (0.400 in.). Fuel is drawn into the pump cylinder through a port in its wall and forced out through a check valve in the axis of the cylinder. The cylinder is mounted between interior and exterior guides and can be moved axially by means of a control lever. This changes the position of the inlet port relative to the ends of the plunger strokes, thus changing the effective length of the suction stroke and the delivery of the pump. A single inlet port is used, for which the advantage is claimed that the suction will always press the plunger against that side of the cylinder where this port is located, so that the metering will be correct even if the plunger should have considerable clearance in the cylinder. The control levers on all nine pumps are connected by links to a control ring mounted on a cylindrical surface of the crankcase. Means of adjustment are provided by which both the link and the lever can be shortened or lengthened so that both the full load and the idling delivery of each pump can be independently varied. The useful stroke of the pump is only about 0.080 in. and delivery begins only toward the end of the piston stroke when the piston already has attained considerable speed.

Injectors of the closed type are used, the poppet type of valves being forced against their seats by coiled springs. On the conical seat of the surface proper there are nearly tangential grooves, and the force with which the fuel passes through these grooves at high pressure causes the valves to rotate, thus cleaning the grooves. These grooves form passages of about 0.008 in. diameter, and the small depth is said to assure high penetration at all loads. Moreover, the grooves being quite shallow, a greater number can be employed, which assures better distribution of the fuel throughout the air charge, and the tangential injection produces a turbulence proportional to the speed of injection.

The fuel employed for this engine is gas-oil with a specific gravity of 0.86, a flash point of 194 deg. Fahr. and a heat value of 17,000 B.t.u. per lb. The specific consumption is claimed to be less than 0.44 lb. per hp.-hr.

Lubrication of the engine is by the dry-sump system, and the oil enters the crankshaft through a spherical joint, of which a sectional view is shown herewith.

Hill Engine Injects Fuel Into An Auxiliary Compression Chamber

A SHORT time ago there was carried in these columns a news story regarding the trip of a Hill Diesel-engined truck from Lansing to New York and return. Believing that our readers might be interested in design details of this engine we have secured a number of cross-sections of the four-cylinder unit used in this run.

It is understood that the Hill Diesel Engine Co. of Lansing, Mich., is now engaged in developing a six-cylinder edition of this engine, which is expected to develop in the neighborhood of 70 hp. The four-cylinder unit developed around 40 hp., for an engine weight of around 400 lb. No attempts were made to achieve unusual lightness in this engine, since it was developed primarily as an auxiliary engine for use on motorships, yachts, etc.

In the Hill Diesel engine the fuel is injected into the main combustion chamber in gaseous form. Sufficient turbulence to assure complete admixture is produced by the provision of an auxiliary combustion chamber in the head, with a restricting orifice leading into the main chamber. During the compression stroke compression is built up simultaneously in the main and auxiliary chambers. Fuel is injected into the auxiliary chamber under a pressure of around 1500 lb. p. sq. in., against a compression pressure of about 500 lb. p. sq. in., the compression ratio being between 15 and 16 to 1. Overhead air and exhaust valves are operated through side rods and rocker levers. The engine is designed to operate at around 2000 r.p.m.

The fuel supply system comprises a low-pressure pump supplying oil to the individual pumps for the cylinders, these being grouped in one unit and operating off a camshaft driven off the front end of the engine. An adjustable metering pin (A, Fig. 2.) is regulated by the "throttle," restricting the flow or opening wider the passage to the injection pumps. From here the oil passes into an annulus around the

injection plunger *B*, and thence up through a drilled hole in the plunger itself. A ball check valve *C* is provided at the upper end of the piston chamber to prevent the return of high pressure oil into the pump chamber.

The plunger is an extremely close fit in the cylinder barrel. As the camshaft raises the plunger the opening to the oil-supply line is shut off, and as the pressure is increased the oil is forced into the pipe leading to the injection valve. A spring return is provided for the high-pressure plunger.

The injection nozzle has a single orifice of 0.020 in. diameter. It is claimed by the Hill company that in this design, owing to the use of a precombustion chamber, there is no need for a small orifice or a series of small orifices, hence the danger of stoppage of the fuel supply by choking of small injection holes is eliminated.

As regards the rest of the engine, the cylinders are a single iron casting which is set on a crankcase cast of aluminum alloy. Main bearing studs extend through the cylinder block to the cylinder head, the object being to relieve the aluminum-alloy block casting of the major part of the bearing load.

Bore and stroke of the four-cylinder engine are 3½ and 6 in. respectively. Fuel consumption is said to be about 0.44 lb. per horsepower per hour. In the engine designed for marine use two lubricating pumps are provided, one for pressure and one for scavenging, the so-called dry-sump system being used. For truck or bus work this would probably be changed to a single pump, with the lubricating oil carried in the crankcase. Pistons are of Lo-ex aluminum alloy and carry four rings each, one for oil control and three for compression. Cuno filters are used for the lubricating oil and the fuel.

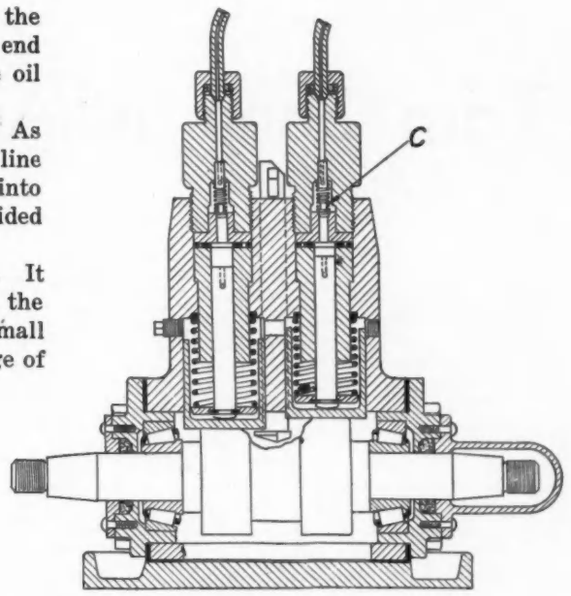


Fig. 3 — Longitudinal section of the injection pump

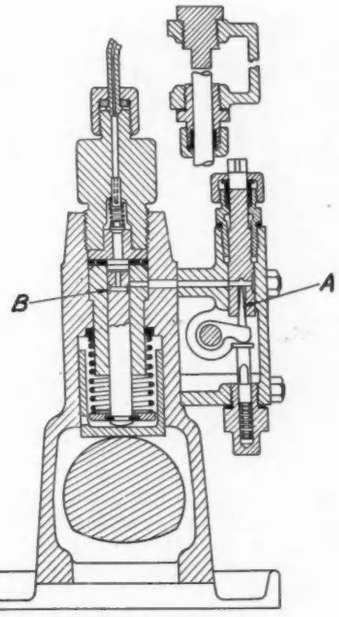


Fig. 2—Transverse section of the injection pump

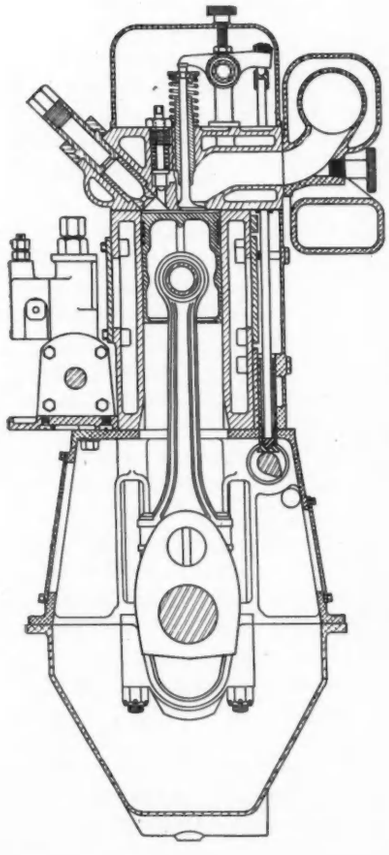


Fig. 1—Section of the engine

Fuel Consumption

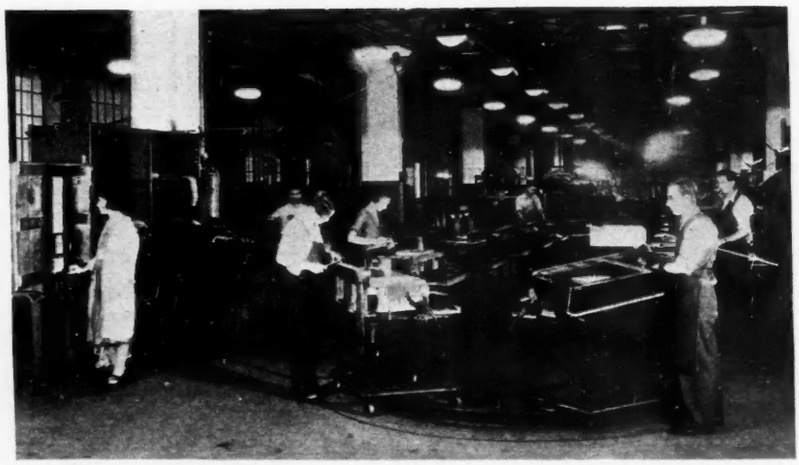
SOME interesting figures with regard to the respective fuel consumptions of different types of engine are obtainable from results of a tractor competition held in England some short time ago. A total of 31 engines took part in the bench trials or belt horsepower trials. These included four different classes, 12 being kerosene engines, 10 gasoline engines, 5 Diesel engines and 4 hot-bulb engines. The average fuel consumptions of the various classes at full load and at one-quarter load are given in the following table:

Specific Fuel Consumption in Lb. P. Hp.-Hr.		
Type of Engine	Full Load	One-Quarter Load
Gasoline	0.77	1.97
Kerosene	0.79	2.80
Hot-Bulb	0.83	1.69
Diesel	0.58	0.88

It will be seen that the Diesel engine consumes only about 75 per cent as much fuel as the gasoline engine under full load and considerably less than half as much at one quarter load. At low loads the kerosene engine is the least efficient, which, of course, is due to difficulties of vaporization and distribution. The hot bulb type, according to these tests, is slightly less efficient than the gasoline engine at full load and more efficient at one-quarter load. The tests, of course, were made under strictly comparable conditions.

Trim Shop is Automatically Scheduled

By virtue of an unusual layout at Dodge Plant, logical subdivision and arrangement of operations and almost complete mechanization costs have been reduced to a marked degree



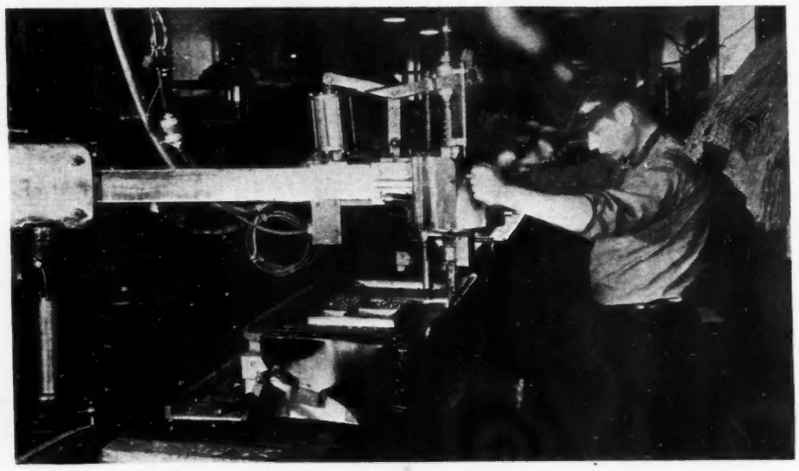


Fig. 1—Close-up of the merry-go-round on which the wood frames for seats are built. Note the telautograph at the left + + + + + +

Fig. 1A—In the center of the merry-go-round is a high frequency screw driver + + + + + + + + + + + +

by
J. Geschelin

AS simply as the action of an electric signal, the entire mechanism of the new Dodge trim shop is set into motion by the lowering of a painted body from the finishing shop above. Thus the potentialities of automotive manufacturing methods assume a new significance in their application at the Dodge Bros. Corp., Detroit.

Following the straight-line production methods so eminently successful in chassis departments, all trim operations have been finely subdivided, mechanized as far as possible and arranged in logical sequence along the body trim line. Each individual item of trim is completely processed within its own

to Fit Progress of Assembly Line

Fig. 2—Here is seen a merry-go-round larger than the one shown in Fig. 1. On this the front seat is trimmed and finished + + + + + + + +

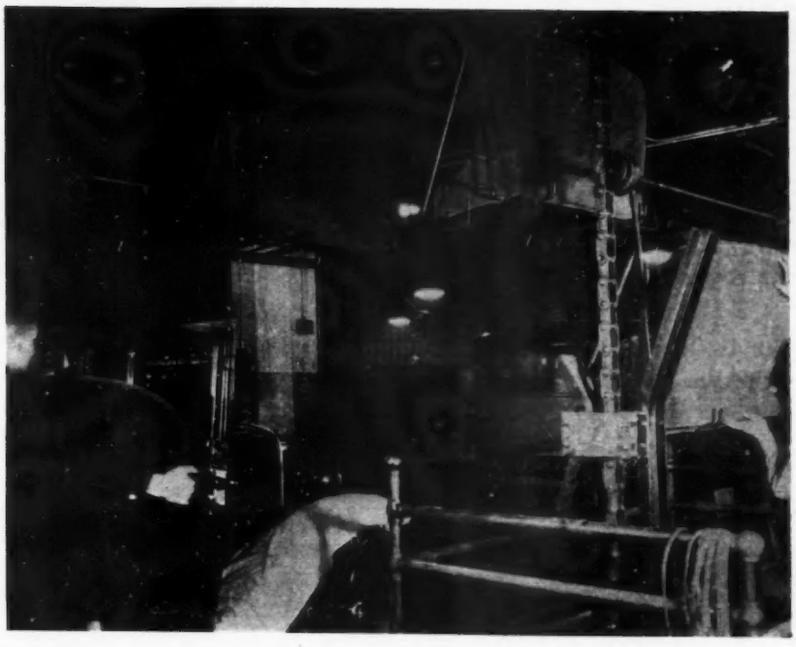


Fig. 3 — This elevator feeds the two final assembly tracks + + + +

self-contained manufacturing department located directly at the assembly line. All work within the department progresses toward the assembly track and ultimately reaches storage bins right at the line, from which the line is fed directly.

Probably the outstanding feature of the setup is that all departments are scheduled from telautograph stations controlled by a single dispatcher who signals his instructions every time that a body enters the trim shop through the body drop at which he is stationed.

Contrary to orthodox practice, the trim shop departments do not operate on a definite predetermined schedule. To be sure, there is a forecast which determines the primary banks of raw material, and small banks of finished materials in the storage racks. But here the comparison ends. The chief function of the operators in the trim department is to maintain the established banks, making more or less of each style or color, depending upon the demand on the assembly line.

Paste conveyors have some innovations here that will be of unusual interest. Not only do these conveyors act as a means of transferring work from operation to operation, but they also serve as the primary assembly line. That is to say, once the work has been laid on the conveyor, it stays on the conveyor without being removed to some outside or remote work bench. At some stations along the line this is accomplished by building a plate or table directly over the belt so that even here the work is merely lifted from the belt to the plate, then dropped again on the belt.

Another significant process is that of making roofs in complete units. For this purpose they have developed a number of interesting machines and assembly fixtures, which will be described in detail later.

Assembly operations along the body trim line occur only at certain definite points. Consequently, as the body moves along the line and passes the various manufacturing stations, the necessary items of trim are selected from the storage racks by an operator in each department and simply laid into the body. Then at the assembly stations groups of individual parts are fitted into their proper place. It might be well to mention that the assembly stations along the body line, as well as in other parts of the Dodge plant, are completely equipped with high-frequency, portable electric tools. Current for these tools is distributed by a system of "Bull Dog" overhead trolley-ducts.

Consistent with the idea of making trim units at the point of usage, seat cushions and the entire front seat are made in different parts of the plant, as they are required only at the final chassis assembly line.

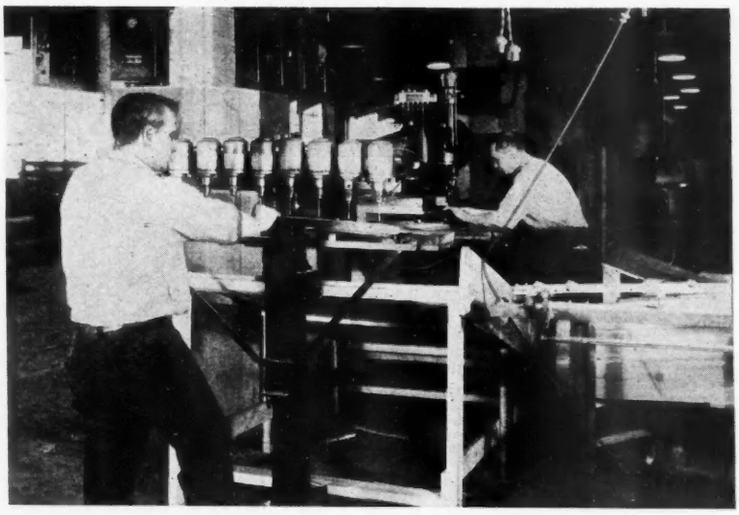


Fig. 5—An automatic drilling machine is used for simultaneously drilling a number of holes in one of the roof members

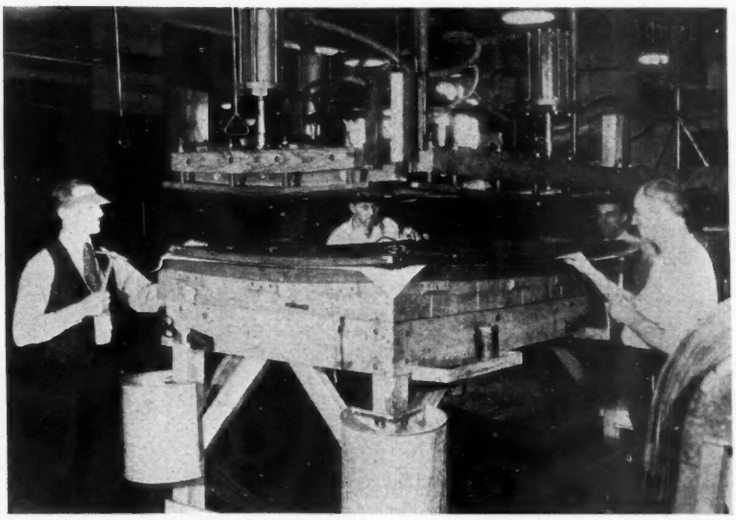
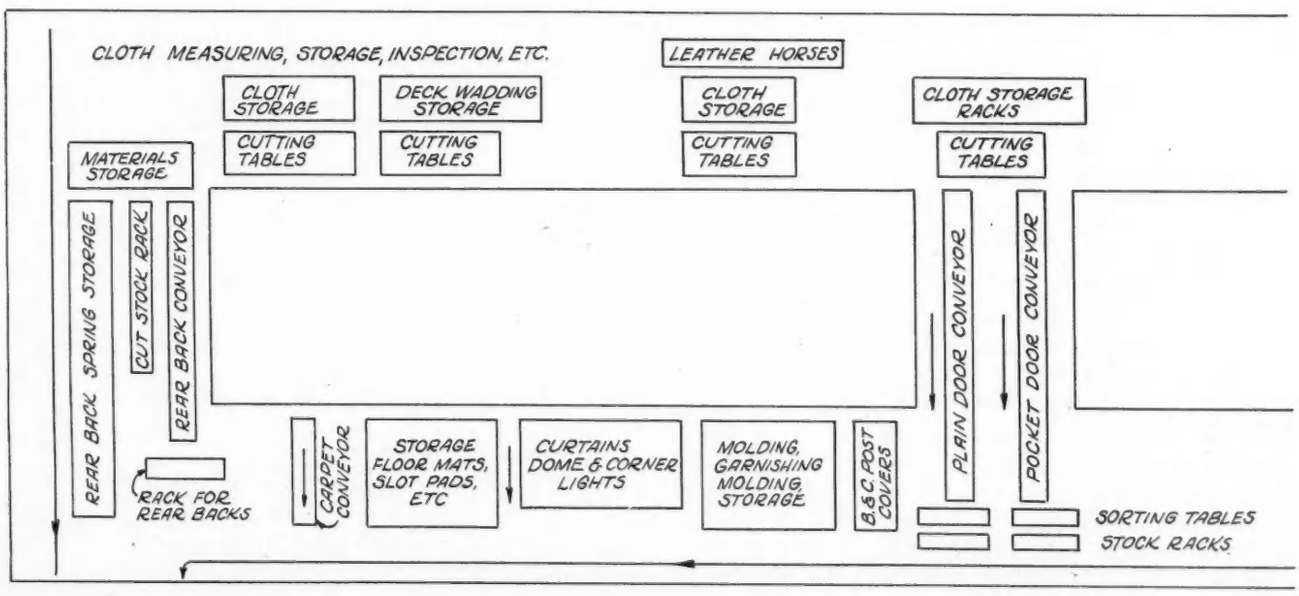
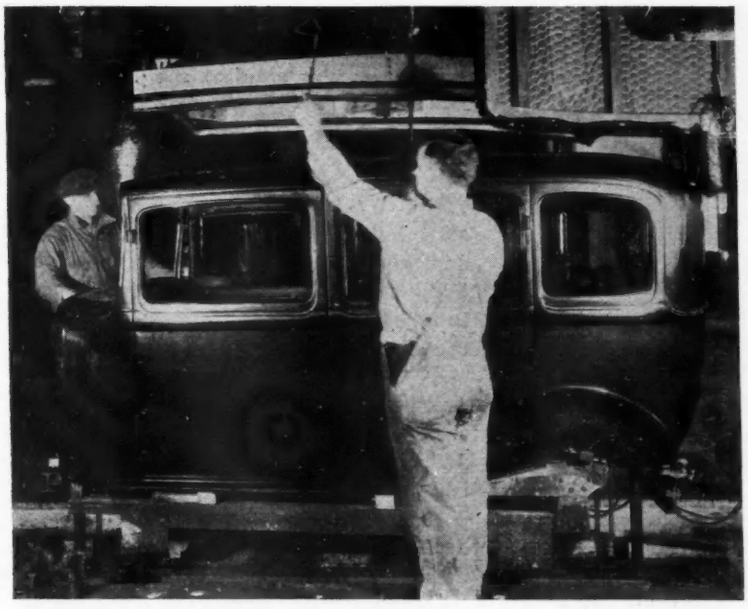
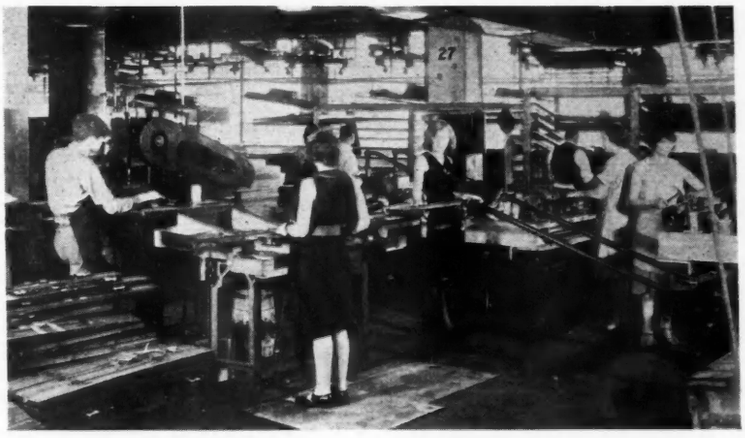


Fig. 6—A stretching machine is used on the roof covering + + + + + +

Fig. 4—Below is schematic drawing of the layout at the Dodge trim shop + + +







By virtue of this unusual layout, the logical subdivision of operations and their arrangement, and the almost complete mechanization of all operations, costs have been reduced to a marked degree.

Practically all trim shop operations, except those of making cushions and front seats, are located on the third floor of the pressed steel and body buildings, as shown in the diagrammatic layout shown below. Since it is not feasible to give much detail, we have tried to show the general character of the layout and indicate the location of only certain major operations.

Everything starts at the body drop located at the northeast corner. The body comes from the paint shop on the fourth floor, its entrance being the signal for the general instructions issued by the dispatcher stationed at that point. A little west of this point, along the north aisle, is located the deck department where the roof unit is built up and later installed on the body.

As an example of the many ingenious machines and fixtures designed for this shop, we have selected Fig. 5, which

Fig. 7—A fixture similar to the stretcher is used in attaching the roof to the body

Fig. 8—Here is an intimate view of the windshield regulator header department

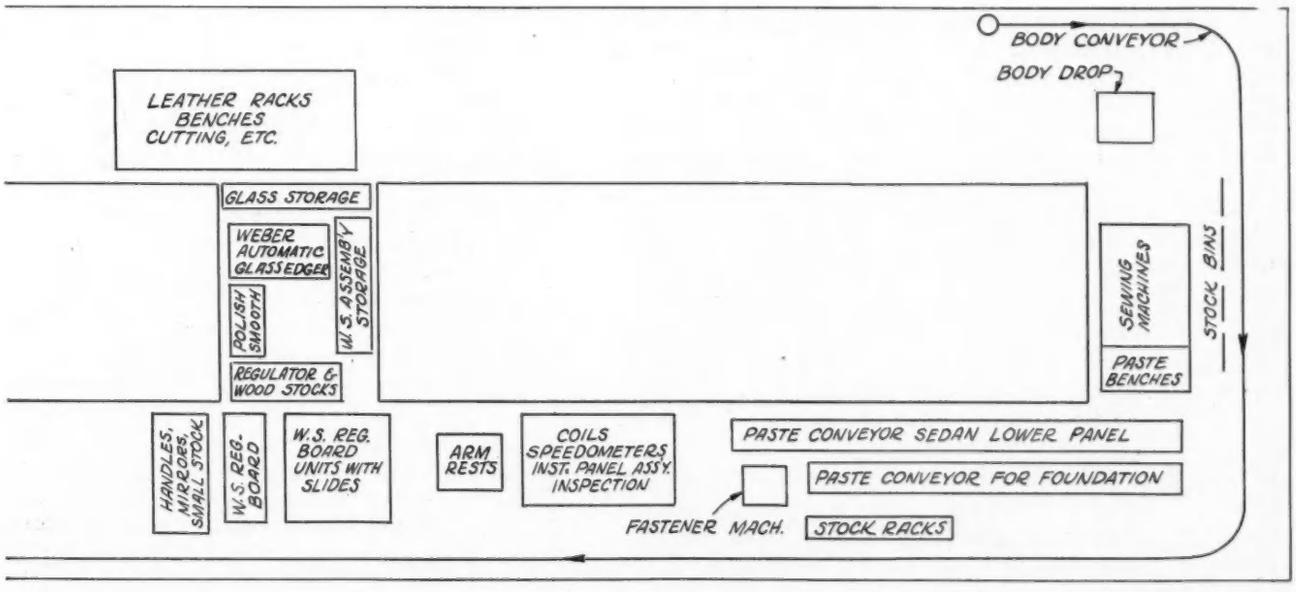


Fig. 9—In this view of the pocket door conveyor is shown a Kurth & Knapp air drier in the background + + + +

Fig. 10—The arrangement for the manufacture of windlace is an ingenious setup + + +

shows an automatic drilling machine for simultaneously drilling a large number of holes in one of the roof members. Generally, operations of this kind are accomplished by means of a portable electric drill with satisfactory results. However, their machine is a big stride toward increased productivity, as all holes are drilled at the one time. The drilling head consists of the requisite number of universal electric drills, which were salvaged when the high frequency installation was introduced. A single switch controls all the drills and the movement of a foot treadle brings down the head.

Building the deck is placed on a new basis by the introduction of a stretching machine, shown in Fig. 6. Using the completed roof structure which is placed in the fixture, four operators—one at each corner—hold the deck covering taut until the air-operated stretcher frame comes down and holds the covering firmly in place. Then the operators tack down the fabric with utmost ease.

There is no attempt to specifically schedule roof assemblies. They are made up in predetermined quantities and ride on the overhead conveyor until used. An adaptation of the stretcher fixture is of inestimable value on the short assembly line near the body drop where the roof is attached to the body. Fig. 7 shows some of the details at this stage. As the initial step at the roof assembly, the operator presses the floor pedal, shown at the extreme left in the foreground, actuating an air-operated fixture which lifts the body off the truck and offers a solid supporting frame whose function is to relieve the strains on the body structure by distributing them properly when the pressure of the deck fixture is applied. Then the operator pulls the overhead valve to lower the stretcher fixture into position. While the roof is held down firmly, the operators at this station screw it down from the inside by means of portable high-frequency screw drivers. Illumination for the inside of the body during the process is provided by a cluster of lamps in the floor. These light sources, protected by a wire netting, may be readily seen in the floor directly under the body truck.

The path of the body conveyor track through the trim shop is clockwise, starting at the northeast corner along the east wall, then around to the south wall, turning out at the southwest corner, and for convenience we shall follow through in the same direction. Approaching the southeast corner, we pass a manufacturing department with a battery of sewing machines and paste benches. Stock bins containing finished parts will be seen directly along the conveyor lines. Right around the corner on the south side are two paste conveyors, one for the sedan lower panel, the other for foundations. Again, stock racks containing finished parts are located along the line.

Next we come to a section containing storage space for coils, instrument boards and instrument board units. Here the instrument boards are completely assembled, inspected and stored until used. Further along the line is a small manufacturing department which produces arm rests.

The windshield regulator header department discloses some skillful planning. An intimate view in this department is shown in Fig. 8. As finally worked out, the male operator assembles the various metal parts on the board by means of the high-frequency screw driver and then passes the finished unit to the girl at his right. When her part of the job is completed she distributes the boards to the six female operators in the center via the first set of slide rails which slope

Fig. 11—By means of this fixture an improved type of fastener can be used at a saving in cost + + + + + +

from the center down to the ends. What she does in effect is to lay one board at the center and then slide one board down the right and then the left side respectively. This carries material to three stations, providing the two operators at each station with a continuous flow of material.

The major operations having been completed, the headers pass to a single operator who sorts them and places them in the stock bin. This is accomplished by means of a second set of slide rails which converge from the left and right ends down to the center. With this arrangement the operators at the center table place their work right at the central loading station, while the operators at the end tables lay their work on the slide rails which carry the pieces down to the converging station.

The first north and south connecting isle marked "AA" is devoted entirely to glass. Here is found finished and unfinished glass stores, the windshield assembly and storage, and a complete battery of Weber automatic glass-edging machines. This installation of glass edgers is one of the largest in the automotive industry.

The second north and south connecting isle, "BB," houses two large paste conveyors, one for pocket doors, the other for plain doors. Fig. 9 shows a view of the pocket door conveyor with one of the Kurth & Knapp air driers in the background. Several of the working stations shown here illustrate the principle that all primary and sub-assembly operations are performed immediately adjacent to the conveyor line or directly on it.

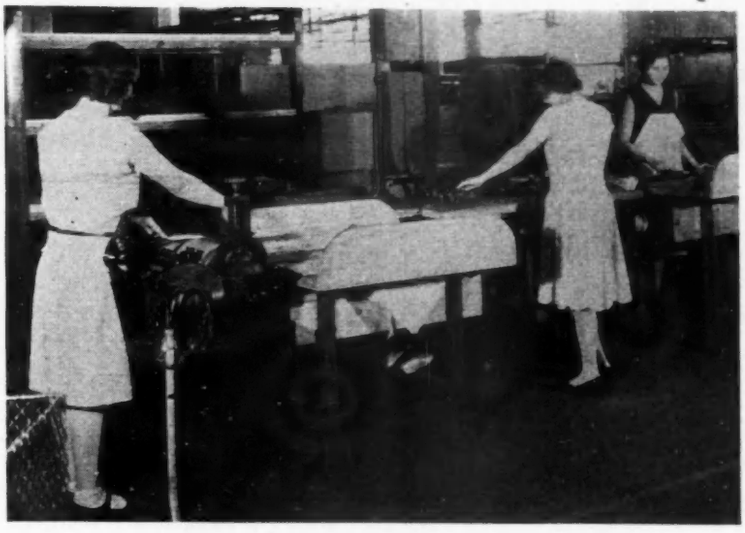


Fig. 12—The first operator here is shown at the paste roll, the second placing the cloth in the fixture while the third turns down the inaccessible corners and places it in the bins at the assembly line + +

Work along the paste conveyors is based upon an hourly schedule, operations progressing from the north to south where the units are separated at sorting tables and finally laid in the stock racks immediately at the assembly line.

Fig. 10 shows an ingeniously conceived setup for the manufacture of windlace. Although the photograph does not show it, the windlace comes off the machine in a long strip which is guided in a trough extending out in front of the operator. The knurled wheel immediately in front of the sewing machine head is connected to a counter and electric trip mechanism at the operator's left, the unit being calibrated to operate an electric circuit when a predetermined length of lace has run through. When the counter trips, it operates the shear at the front edge of the table and cuts off the windlace to the required length. Simultaneously jets of air along the trough come into action and eject the windlace from the trough directly into a bin below. Changes in length of windlace during the production are readily effected by changing the knurled wheels, a number of which are seen at the operators' table.

The next high spot is the manufacturing department for "B" and "C" post covers which consist of thin strips of wood provided with inserted fasteners and covered with cloth. By means

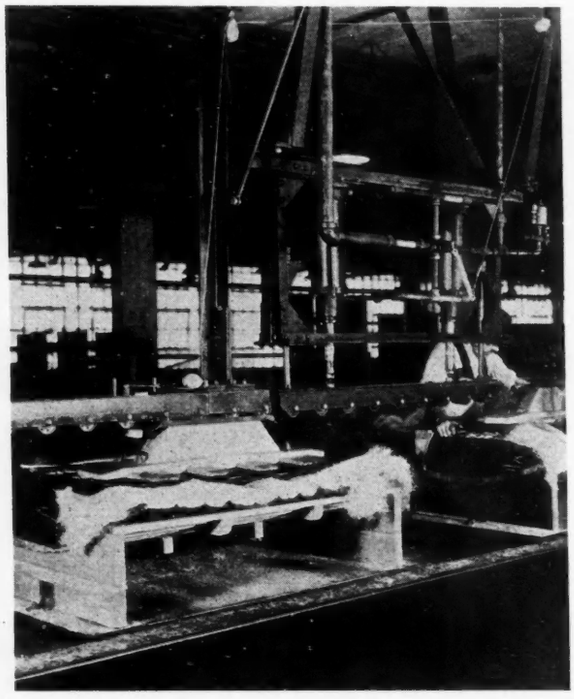


Fig. 13—The function of this fixture is to depress and hold the prepared seatback until it enters the main conveyor + +

of the fixture shown in Fig. 11, not only is an improved type of fastener employed, but the cost of the operation has been reduced to a fraction of the previous cost. The machine shown here has four air-operated plungers acting on a set of punches which push in the fasteners. The final operation on this piece, that of pasting the cloth and turning the edges, also has been highly mechanized. As shown in Fig. 12, the first operation is at the paste roll, then the foundation with the cloth is set in the fixture shown in the center, which by the action of the foot treadle, stretches the cloth and turns down the edges. The third operator turns down the cloth at the inaccessible corners, sorts out the stock and places the finished pieces in their proper bins right at the assembly line.

The next group along the south wall consists of floor accessories such as mats, carpets, foot rests, etc. There is a small manufacturing department for foot rests and a carpet conveyor. At this station the floor accessories are rolled together and small banks stored along the assembly line. Since Dodge practice is to have the floor accessories installed by the dealer, this roll is laid into the body and continues in this fashion right through to the shipping dock.

Rear backs are built up complete in the manufacturing department located at the southwest corner. Easily the outstanding feature of this department is the long and unusually impressive Kurth & Knapp assembly conveyor. This type of conveyor is probably familiar to most readers, although it has been in use for a relatively short time, one of the earlier installations being described in *Automotive Industries*, Oct. 12, 1929. Probably the best feature of this installation is the separate fixture at the entering end shown at the right in Fig. 13. The function of this fixture is to depress the prepared seatback and keep it under proper tension until it enters the main conveyor. Observe near the fifth roller a small trip lever connected by a cable overhead guided by pulleys to the unloading valve on the fixture. Its function is to release the preloading fixture just as soon as the seatback enters the conveyor.

By the very nature of things, the largest amount of storage space and by the same token the largest amount of stock of any nature is the leather and cloth storage which starts at the northwest corner and runs up a considerable distance on the north side. In this department, seasonal requirements for cloth are stored in rolls on special racks.

Cutting tables are organized to operate in teams and we are told that this is one of the few installations employing female help on this type of work. In operation, a male and female operator lay out the patterns, a man follows up and cuts up the material, then a girl clears the table and sorts out the finished work.

The front seat is built in the other plant on the floor directly below the final assembly lines, again carrying out the principle of building units directly at the point of usage. Fig. 1 is a close-up of the merry-go-round on which the wood frame is built up. The telautograph station in this department is shown at the left. In the insert, Fig. 1A, is a close-up of an interesting high-frequency screw driver with a freely sliding radial arm, which is used near the center of the merry-go-round, at the right-hand side. The novel thing about this machine is the air clamping attachment which literally gears the sliding arm to the work conveyor enabling the screw driver to follow the work on the conveyor without interupting the cycle.

Fig. 2 shows in fine detail a large merry-go-round in the adjoining room where the front seat is completely trimmed and finished. One of the features here is the double-sided fixture permitting two seats to be built up at each station. This fixture is universally adjustable, as will be noted from the position of the work at the right, thus permitting an operator to work with facility on any side of the seat.

Although the work in this department is scheduled simultaneously with the activities in other departments, the actual delivery of finished seats is keyed with the progress along the assembly line on the floor above. This is accomplished by verbal instruction from the assembly line transmitted through two loud speakers, one of which is shown at the ceiling in the foreground. The elevator (Fig. 3), which feeds two final assembly tracks, is loaded according to these verbal instructions.

It must be gratifying indeed to find that the ultimate results show lower costs, decreased inventory, and a layout so flexible that the program can be shifted at almost any time. This is one of the few examples where an entire trim shop is scheduled automatically to tie in with the progress of the main assembly line.

Fredrick E. Moskovics—"Advancement in any art is merely the measure of cooperation of everyone in that art" + + +

If I Were An Engineer Today—

I would encourage the exchange of ideas in technical society meetings, in the trade press and wherever I met my fellow engineer

says Fredrick E. Moskovics

A LOT has been told and written about the heartiness with which we in America exchange ideas, how free we are to give and get. But when finally analyzed, how far does it really go?

A good start hasn't even been made, it seems to me, and the fundamental fault lies at the door of our better known automotive engineers.

A strong tendency has been noticeable in late years toward less frequent attendance by the chief engineers at meetings of the S.A.E., both sectional and national. And how few of them today contribute to public discussions and the literature of the art!

One can take up almost any foreign trade publication and read an interesting debate between men quite prominent in their country. Sometimes these discussions become quite heated, but never acrimonious.

I can instantly recall but two papers, on the other hand, submitted by prominent American chief engineers in the past few years on a major topic. Yet, with the tremendous mechanical strides our industry is taking at this time, was there ever a time when such papers were more needed? Or, when it would be more helpful? Are the days completely gone when a summer or winter meeting will again be entertained with real discussions by men like Marmon, Vincent, Fergusson, Duesenberg, Kettering, Gallup, Midgely, Coffin, Alden, Wall, Hunt, and a host of others? Those were the days of interesting and interested meetings!

Please do not feel this is an indictment of the S.A.E. Meetings' Committee. There never was a time when more interesting papers were being presented, but they are not discussed and argued over by the "big

shots"—the real technical leaders of the industry; the men whose names are well known, as they were in the past.

I am not particularly shedding tears for the "good old days"—living in the past is a dangerous mental process to get into—but I do feel that infinitely more mental cooperation today can be attained.

It is one thing to open laboratory and testing equipment doors on predetermined days, and another thing entirely to open the intellectual and mental doors every day. The latter is what we need. Only a few of the greater organizations can afford the entire gamut of surroundings that make for the best engineering advancement, but would they bring before the less fortunately situated the concentrated advantages of these fortunate circumstances? I feel the resultant returns in equally frank discussions would more than repay them. It is the old, old saying: "You look out more than you look in."

The greatest laboratories, the greatest testing and experimental equipment does not necessarily become a substitute for versatility and brains and originality. Of course, they are great aids, but original thinking still does and will hold its place. So, the more original thinking that can be encouraged, the better for the engineer and his future, even if some one else does it for him. The more new and advanced ideas that are promoted, the more necessary becomes the real engineer, the more essential becomes the creator. Even if some one else brings out a real new but worthwhile idea, it helps every other man in the profession.

Thus, if I were an engineer today, far from feeling any jealousy at any new idea brought out by others, I would encourage it in every way.

The Exchange of Ideas Helped Both

I recall an incident a few years ago where an engineer, representing one of the smaller companies, came to me for advice about a half-baked idea. He had reached the end of his company's financial ability and his mental capacity. I happened to know that one of the greatest engineers this industry has ever developed had, a few years before, worked on substantially the same lines. So I got the two men together. In three days, the first engineer obtained information and data that otherwise he could have obtained only through expenditure of months of time and lots of money, neither of which he nor his company could afford. The following year his firm marketed a car embodying that very development.

You might well ask: "Why did the second engineer give away this apparently valuable information?" I did. The reason is simple: He had reached a point where nothing else could be done with the device until it was proven in actual service. That could only be done by building and closely watching hundreds of them under field conditions. His company was at that time (and is today) very successful and could not take the chance to experiment with the device in production. In other words, they were not driven to that business gamble at that time, so in return for the information he gave, he received the full information as to the field performance, as well as all shop rights, and it was a fine business move as well as a fine thing to do. That engineer today is invaluable to his organization. He thinks big, acts big, and is big.

Did I mention that he had quite a job to sell the president of his company on his idea? Well, he did. In fact, I helped him to do it. The president took the old, old-fashioned point of view—"What do I get?" As a matter of fact, it developed 18 months later that he got back much more than he gave. All of which merely illustrates that advancement in any art is merely the measure of cooperation of every one in that art.

And that includes the press representing that art. I even have my quarrel with it. I fear and tremble that this may be "lese majeste," but I feel even if they shouldn't carp and criticize, they should be, at least, directing the channels of thought, whereas, usually they merely present to you the cold facts and sort of say "Take it, or leave it; as you like."

There Are Plenty of Golden Facts

The facts are there in our automotive business press—golden facts. But you are left to determine their relative importance in most cases. I feel that the pace of mechanical trends should be editorially commented on in an attempt to force the engineer to think along the lines of future development. To illustrate, I believe *Automotive Industries* had one of the most interesting and important articles on the lines of future development in its history a few weeks ago. It looked almost inspired and certainly was prophetic. Yet not one word of editorial comment appeared on its value as a line of future development. I refer to an article and illustrations by P. M. Heldt on Independent Wheel Springing.

Please do not consider I want to press my views as to the relative value of future development beyond some one else's, but even at the expense of chancing a prediction—*keep your eye on independent wheel suspension!* In the near future—now, right or wrong, I claim somebody in the trade or technical press should tell us that. Just now they leave it to us to find it out. Some of our best engineers do not read and study the trade publications as much and as carefully as they should. Perhaps it's too much trouble to come to their own conclusion. Never in 25 years have I missed a word in three foreign and several important American trade publications. My interest is largely that of curiosity (at least, just now), but I do not know how, for so little effort, I can know what others are doing, thinking, and how and why they are doing it. And I do not see, if the real spirit of cooperation permeated this industry, how much useful knowledge, so essential to real intellectual advancement, could be better or more easily disseminated. And once again—

> "I keep six honest serving-men
> (They taught me all I knew);
> Their names are What and Why and When
> And How and Where and Who."
>
> —Rudyard Kipling.

Just Among Ourselves

Will Wonders Ever Cease?

ON the morning of Friday, Nov. 14, 1930, an absolutely unique and unprecedented event in our life took place. Breath-taking in its novelty, daring in its conception, courageous in the face of business depression was this event—and yet it happened to us—for the first time.

An automobile salesman telephoned us and asked if we would be interested in a new car!

Whatdoyouknowaboutthat?

Hard to Believe But True

IT was a pretty good solicitation, too, we thought. It started out something like this: "Your name has been given me as the owner of a Blank car; my name in Schu of the Blank agency in Germantown. I just wanted to find out if your Blank car is giving you satisfaction. How do you like the car?"

"Fine," was our reply. "I am very well satisfied."

"That's good," came the response, "we just wanted to be sure that your car was running all right. You probably aren't interested in buying a new car right now, but I wonder if you could give me the name of some friend who might be?"

"No, I can't think of anybody at the moment—and I'm not interested in a new car myself."

"By the way, have you driven one of our newest models?"

"Yes, I have."

"How do you like it?"

"Wonderful. But in order to buy one it's necessary to have something to use for money. That lets me out."

"You're sure you don't have some friend who might like to try one of these new models?"

"Well, now as a matter of fact one of my friends was asking me about your new model the other night. Said he'd like to drive one. Here's his name . . ."

"Thank you very much. And if you don't mind I'd like to call you up from time to time to see how your car is going . . ."

He didn't sell an automobile, of course, but we thought it was a pretty good cold-turkey solicitation. We may be pardoned, perhaps, if we are too enthusiastic about the presentation because after all we aren't experienced in receiving them. One in fourteen years of business life can scarcely be classified as "a lot."

Now we're going to be interested to find out whether our friend ever was called up and offered a demonstration.

Just One Part of a Big Whole

THE automobile constitutes one of the most important developments in communication of the late nineteenth and early twentieth centuries. But it is only one. Telephones, telegraphs, wireless, radios, aircraft, all have been added to a speeding up of railroads, shipping and older forms of transferring ideas and goods from one place to another. Communication facilities have brought every point in the world very close to every other point. It has woven the economic fabric of the world into a single pattern. The marketing problems of every manufacturer in the automotive industry must be solved in relation to a far more complicated economy today.

What Happened Between Tides

NET decrease in number of automobile dealers between Jan. 1, 1930, and Nov. 11, 1930, has been only a little over 3600 —or 7 per cent—according to figures just compiled from the Chilton Mailing List.

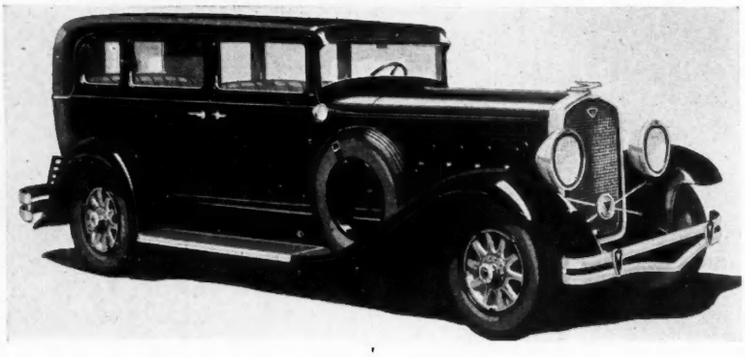
Many more dealers than this have gone out of the picture, of course, but factory sales departments have been busy bringing new ones into the picture. The success that has been achieved is indicated by the relatively small net decline registered to date. A further net decrease is to be expected by the end of the year, but these current figures indicate that the total decline for the year will not be much more than 10 per cent.

The net decrease seems to have been pretty evenly distributed over the country, although a slight increase is recorded in a few cases, notably in Florida, which has 461 retailers selling passenger cars now as against 422 at the beginning of the year.

Some companies definitely have suffered more drastic reductions in dealer organization than others. Figures by companies have not yet been taken from the records in a sufficient number of cases, however, to make feasible publication even of estimates by companies at this time. Later on such data may be available. Wonder if many of our readers would like to see them published? Would you? If so just tear this out and mail it to us. Yes . . No . . .

—N.G.S.

More Power in the New Hudson and



The new Hudson family sedan

Liberal leg room, body insulation for noise and cold, increased rigidity and larger bore are conspicuous changes in the new offerings

"FUNDAMENTALLY unchanged but materially improved" is perhaps the best way to summarize the changes incorporated on the "Essex Super Six" and the "Greater Hudson Eight" for 1931. Prices, given on page 800, are materially lower than those announced a year ago, and in some cases even lower than the recent reduced prices on the old lines.

More power is available in both cars. Shifting is made easier by the use of an aluminum-alloy clutch plate and by changes in the transmission ratios. Passenger comfort has been increased by providing more leg room and by insulating the body against noise, heat and cold. Increased stability and rigidity of the car as a whole are other important developments.

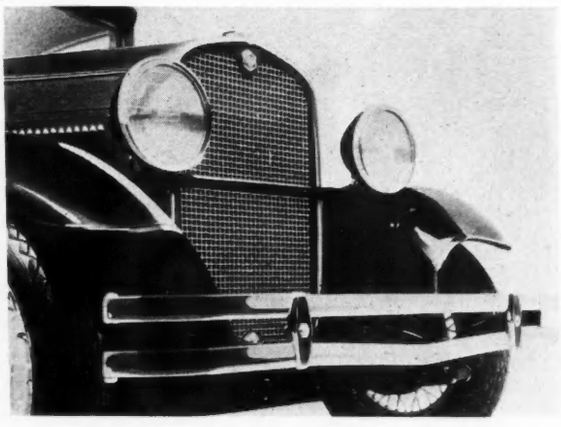
Appearance also has been given attention. Chrome-plated bronze radiator grilles built into the radiator shell are standard equipment. Fender flanges are deeper, which makes for a more rigid fender and affords better protection against splashing. The Hudson in addition has new-style door handles, elliptical headlamps, and a new fender bracing at the front. Two chrome-plated stream-lined tension members serve as fender braces and meet at the center, where a flat vibrator-type horn is mounted. Hood doors extend up higher, and the same is true of the louvers on the Essex. Rear windows are larger.

Improvement in the performance is traceable to a ⅛ in. increase in the bores of both engines. On the Hudson the peak horsepower has been raised from 80 at 3400 r.p.m. to 87 at 3600 r.p.m., while on the Essex the change resulted in 60 hp. at 3300 r.p.m. while the 1930 engine reached this output only at 3600 r.p.m.

The driven member of the single-plate clutch is now made of aluminum alloy sheet 1/16 in. thick. In accordance with long established Hudson-Essex practice, it is provided with cork inserts. The ratio of the low gear in the transmission has been reduced, for a faster get-away.

In the Spicer universal joints a more effective oil seal has been worked out by the addition of a light pressed steel ring between the yoke and the spherical cup. This seal is flanged at its inner end, bearing against a special diameter machined on the yoke bracket. The outer end of the sealing ring presses against the inside of the front spherical cover midway of its curvature.

To eliminate wheel-fight the cars are equipped with a new drag link having two opposed coiled springs at the pitman connection. The joint is protected with a metal cover instead of the usual leather boot. The steering gear proper, moreover, is now mounted inside the frame, the mounting

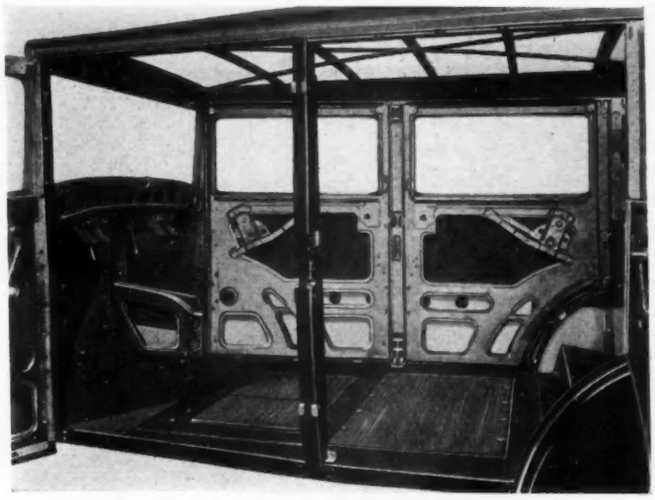


The front of the new Essex Super Six has been considerably changed + + +

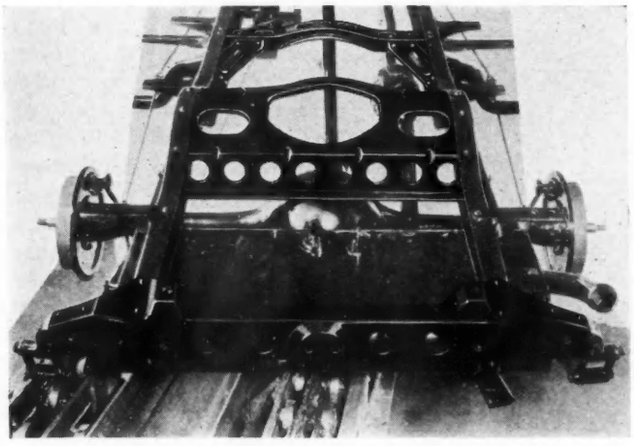
Essex Lines

bracket being riveted to the web as well as the flanges of the side-rail. Formerly it was mounted on the top flange, and the change makes for greater rigidity.

Important changes have been made in the bodies to guard against squeaks and rattles. Two diagonal tension members now tie together opposite corners of the roof. Where these members pass over the bows they are attached to the latter, so that the bracing is similar to that of airplane wings. Heavier brackets and more gusseting are provided at the front pillars. Body sills are extended beyond the junction of the cowl with the dash to assist the frame strengthening. Body mounting brackets have been strengthened by the use of more rivets.



The new construction of the Hudson and Essex models is shown in this view + + + +



A view of the chassis showing the three cross-members of the Essex Super Six + + +

Frame-stock thickness has been increased 1/32 in. Near the front end, at a set of body brackets, there is an additional cross-member below the level of the side rails which joins the outriggers that form the forward supports for the running boards.

The next cross-member toward the rear has new vertical triangular gussets. Still farther back—at the rear-axle kick-up, there is a new type of cross-member which curves with the kick-up. It has cutouts in the top section for lightness and the edges at the cut-outs are turned down to form flanges. The full depth of the frame side rails is carried farther back than formerly. It is claimed that this strengthening of the rear end of the frame materially reduces weaving at the front end.

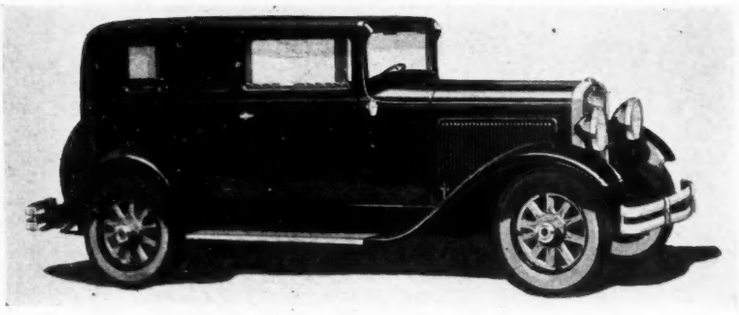
Frames have been strengthened also at the front end, principally for increased fender rigidity. A new plate-type front engine bearer, with flanged edges fastened to a bracket riveted to the flanges and webs of the side rails, is of assistance in this connection. The box-type front cross-member has wider gussets for its lower flange. Sound absorbing felt pads are placed on door panels, on rear-quarter panels, and under the rear seats, in addition to being used on the dash, the cowl sides and the floor board, where such insulation is now customary. Separate grommets against drafts, etc., are provided for the steering column, gear-shift and brake levers.

Additional leg room of from 2 to 5 in. has been obtained in the various models by sinking the rear seatback more into the rear of the body. Additional headroom at the sides has been obtained by the use of a somewhat flatter roof construction, without increase in the overall height. Robe rails and assist cords are found in all except the lowest-priced models, strap-type pull-to's on the doors in all. Inside door handles on the Essex operate directly on the lock, instead of by remote control as last year. The blade of the automatic windshield wiper, when it is not operating, lies flat against the top of the windshield, instead of at some angle before the driver's eyes.

Returning to the chassis, the double-acting oil pump adopted last year is retained, but the oil returning to the crankpan is made to flow from the center toward the ends, and then back to the center before it can again be picked up by the oil pump located here. This assures lower oil temperatures under the worst conditions.

In the Hudson the water pump and the sections of water passages have been materially enlarged, to insure an increased rate of water flow. The fan has been raised for increased effectiveness, and the height of the louvers has been increased for better airflow. Radiators on both cars are said to be more efficient. The Essex also has larger water passages in the block.

A drilled passage from the carburetor to one branch of the manifold through which passes the heavy fuel mixture required for starting, facilitates cold-weather



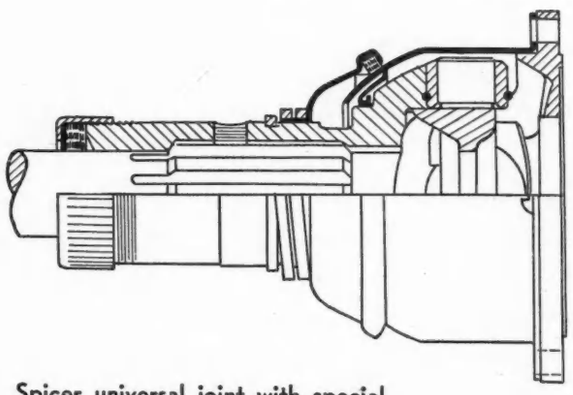
The Essex coach has been designed with large rear windows + + + + + + + + + + + +

starting as compared with last year, when the starting mixture had to be raised through the larger riser.

Aluminum alloy pistons are said to expand irregularly, the greatest expansion taking place on a diameter about 45 deg. from the piston pin axis. Hudson therefore finishes pistons to an elliptical form, providing more clearance at points of maximum expansion, which permits of reducing the clearance allowance without danger of seizure. In the Hudson-Essex pistons for 1931, the vertical part of the T-slot is not carried to the bottom of the skirt, giving a stronger piston skirt. This was made possible by the cam grinding.

Adoption of a new oil ring is said to have reduced the oil consumption by 50 per cent. It is chamfered at the top, has a groove in the center, and a scraper step at the lower edge. Oil holes back of the two lower rings have also been increased in size. The Essex now carries a three-jet carburetor.

In the transmission different pitches are now used for the constant-mesh and second-speed gears, to reduce noise. The interlocking mechanism between the clutch and the shifter rod for the high and second gear has been retained. Spring seats are now located near the center of both front and rear springs, reducing the "eccentration." Double-acting hydraulic shock absorbers are retained. A larger starting motor has been adopted on the Hudson, light switches on both cars are now mounted on the steering column, and are protected by a metal cover, and the ignition coil on the Hudson has been removed to the top of the cylinder block where it is out of the way of spray through the radiator. Manually-operated radiator shutters, designed for installation back of the radiator screen, in front of the core, are now offered at extra cost. On the Hudson a double scissors type of "roll-back" has been incorporated at the door handles to insure return of the handles to a horizontal position. On the Essex wire wheels with riveted spokes are now available.



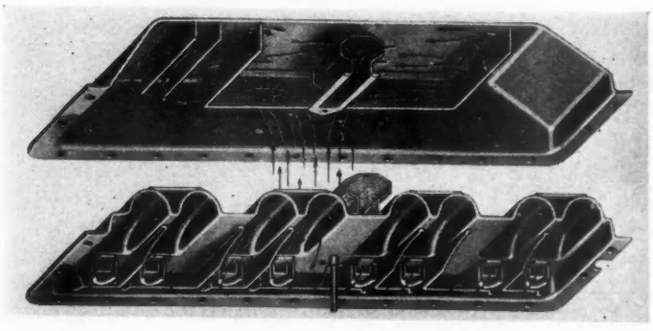
Spicer universal joint with special oil-seal ring used on the new Hudson chassis + + + + +

Six body models are offered on the Essex, and fourteen on the two Hudson chassis. Of these, the sport roadsters on the Essex and 119-in. wheelbase Hudson chassis are entirely new in design, with boat-shaped rear deck and two-passenger rumble seat, set well down in the rear deck. Other Essex body models include the coach, standard sedan with metal rear quarters, town sedan with rear-quarter windows, two-passenger coupe and rumble-seat coupe.

On the 119-in. wheelbase Hudson there are five additional body models, the two-door coach, a coupe with or without rumble seat, the standard sedan with three windows, the four-door, close-coupled town sedan and a five-passenger phaeton.

On the 126-in. wheelbase there are a touring sedan, a seven-passenger family sedan, with seat and backs of the "occasional seats" nicely rounded so that passengers can turn sideways if desired; a brougham with landau-type rear quarters, a seven-passenger phaeton, and a club sedan for the "custom" trade.

Prices on the new lines have been announced as follows: Hudson with 126-in. wheelbase: Touring sedan, $1,145; brougham, $1,195; family sedan, $1,195; 7-pass. phaeton, $1,295; club sedan, $1,445; 7-passenger sedan, $1,450. Hudson with 119-in. wheelbase: Business coupe, $875; coach, $895; rumble-seat coupe, $925; town sedan, $945; sport roadster, $995; standard sedan, $995; 5-pass. phaeton, $1,095; chassis, $825. Essex: Business coupe, $595; coach, $595; rumble-seat coupe, $645; standard sedan, $695; sport roadster, $725; touring sedan, $775; chassis, $530; commercial chassis, $435.



Labyrinthian oil-cooling system used in the new Hudson and Essex lines + + + +

Books for the Business Bookshelf

Five Years of Research in Industry

Published by the National Research Council, New York. Compiled by Clarence J. West.

THIS is a bibliography on the subject of industrial research covering the last five years. Both books and articles in periodicals are included, and the matter is arranged according to subject, the different subjects being arranged alphabetically.

The titles of a considerable number of the articles listed give the impression that the articles philosophize on the subject of research, its relation to human progress and its practical value to the industries, while others, of course, give the results of actual research work. The publication bears the sub-title "A Reading List of Selected Articles from the Technical Press," and no claim of completeness is made.

Digest of Motor Vehicle Lighting Laws and Regulations

Compiled by the Engineering Department of the Edison Lamp Works and the National Lamp Works of the General Electric Co. and published by the General Electric Co., Nela Park, Cleveland, Ohio.

THE data are arranged in the form of a table. There is one line for the Uniform Vehicle Code and one line for each state and the District of Columbia. The provisions of the laws covering headlamps, spotlamps, auxiliary driving lamps, rear lamps, parking lamps, stop signals, marker lamps (for trucks, buses and trailers) and other lamps are given.

Aircraft Accidents—N.A.C.C. Method of Analysis

THIS report (No. 357) is a revision and expansion of the report prepared by the Special Committee on the Nomenclature, Subdivision and Classification of Aircraft Accidents, which was issued as Technical Report No. 308 of the National Advisory Committee for Aeronautics. The special committee was organized by the National Advisory Committee for Aeronautics in response to a request dated February 18, 1928, from the Air Coordination Committee, which consists of the Assistant Secretaries for Aeronautics in the Department of War, Navy and Commerce.

In presenting this report for publication the Committee on Aircraft Accidents appreciates that it can not represent a completed project, as the study of aircraft accidents can never be finished. The report represents the experience of the committee and of the three departments concerned in the study of aircraft accidents up to the present time. The study of aircraft accidents for the purpose of analyzing them in such a manner as to assist in reducing their frequency and severity is a task which can never be completed, but must be continued in step with the progress of the art.

Personenkraftwagen, Kraftomnibus und Lastkraftwagen in den Vereinigten Staaten von Amerika

(Passenger Automobiles, Motor Buses and Trucks in the United States)

By Dr. Emil Merkert. Published by Julius Springer, Berlin.

DR. MERKERT spent two years' time in the United States, most of it in a study of the economics of automobile traffic and of its relation to railroad traffic and to roads. He presents statistical material showing the rapid increase in material prosperity in the United States during the past two decades and particularly since the war. The high average income enables the average American to enjoy most of the articles of comfort and luxury of recent development, such as telephone, electric refrigerator, electric vacuum cleaner, bath, running hot and cold water, furnace heating plant, radio and grammophone. But none of these is in such wide use as the automobile, which, according to the author, ranks among the necessities of life of the average American directly after food, clothing and shelter.

The first chapter also deals in an interesting manner with two other factors responsible for the widespread use of automobiles by the American public—mass production and the time payment plan. In the following chapters such topics as operating costs, factors affecting sales prices, competition between automobile and railroad, control of interurban motor traffic, the road system of the United States and financing of road construction, are discussed. While the book deals with subjects with which American automobile men are quite familiar, it may be said that it handles these subjects in a very commendable way and that it is unusually free from the shortcomings that characterize books written after a hasty investigation of some subject in a foreign country.

Engine Testing

THE Aeronautics Branch of the Department of Commerce, Washington, D. C., has recently published a bulletin on Engine Testing (Aeronautics Bulletin No. 12). It gives the rules under which type tests of aircraft engines are being carried out. Copies of the bulletin may be obtained from the Government Printing Office, Washington.

HOW'S BUSINESS?

GOING TO BE NEXT MONTH

Charted by United Business Publishers, Inc.

THIRTY-FOUR ECONOMIC EXPERTS—EDITORS OF BUSINESS PAPERS PUBLISHED BY THE *United Business Publishers, Inc.*—HERE PRESENT A COMBINED OPINION ABOUT THE COURSE OF BUSINESS DURING THE MONTH OF DECEMBER. GOVERNMENT AND OTHER RECORDS PROVIDE YOU WITH HISTORY OF RECENT MONTHS. THIS BOARD OF EXPERTS DEALS ONLY WITH THE FUTURE. ITS OPINIONS ARE BASED ON CLOSE CONTACT WITH THE MORE THAN 400,000 SUBSCRIBERS REACHED BY THEIR PUBLICATIONS IN FAR-FLUNG FIELDS OF RETAILING AND INDUSTRY.

DECEMBER closes a year that was conceived in hope, met disappointment early, became frankly disillusioned during the long, dry summer, and, when Labor Day failed to mark the beginning of a definite recovery, resigned itself to waiting for something on which to pin a new hope.

"Safety First" and "Save-the-Surface" have been the order of the day. Although in decided contrast to the slogans of the previous year, they have undoubtedly been the salvation of the business structure.

Many retail lines will feel the stimulus of Christmas buying, but a large share of Christmas expenditures this year will go into necessities, or into savings banks already swelled with deposits.

The public that has supported buying with such ardor for the past eight years is apparently taking a holiday from the markets and wearing out its present possessions in anticipation of new goods and new adaptations of old goods that have not been forthcoming.

We step across into a new year with a new hope that the ingenuity of manufacturers and merchants is not dead, and that new goods moved by new methods with that same vigor that built the great advance between 1922 and 1929 will be forthcoming.

Caution has served its purpose. What we need now is a little constructive audacity of the type that has made America, America.

THE COURSE OF BUSINESS FORECAST FOR NEXT MONTH

BUSINESS	SALES	RETAIL STOCKS	COLLECTIONS	COMMENTS
AUTOMOTIVE	Passenger cars about 25% less and trucks slightly less in December than in November. Passenger cars 35% and trucks 15-20% less than Dec. '29.	Passenger cars slightly less and trucks about the same in December as in November. Both lines decidedly less than Dec. '29.	Collections in both lines about the same in December as in November, but somewhat better than Dec. '29.	Dealer and consumer attention is now focusing on the new models that will go on display in January.
DEPARTMENT STORES	Should show increase of 50% over November, but about 8% less than Dec. '29.	About the same as November, but 10% lighter than Dec. '29.	About the same as November, and little change from Dec. '29.	"Useful" and utility items will feature this year's Christmas buying.
HARDWARE	Will be better than November, but less than Dec. '29.	Slightly heavier than November, but appreciably lighter than Dec. '29.	Little difference from November, but lighter than Dec. '29.	Christmas buying should be a decided help in increasing December sales.
INSURANCE	December should show an increase in writings in all lines both over November, and over Dec. '29.		Collections will be slower than in November, but should show an improvement over Dec. '29.	Intensified year-end drives should increase the volume over that of previous months.
JEWELRY	Will be much greater than in November, but generally below Dec. '29.	Will be larger than in November, but decidedly below Dec. '29.	Retail collections should be better, mfr. and whlsr. collections slower than November, and both classes slower than Dec. '29.	The retail jeweler does from one-fourth to one-third of his year's business during December.
MACHINERY METAL PRODUCTS METALS	December steel output estimated at 40 to 50% of capacity.	Machinery industries marking time. Machine tool industry does not look for increased business before Spring.		Any general business improvement should force replenishment of present low steel inventories.
PLUMBING AND HEATING	Slight improvement will continue for the remainder of the year, but below volume for Dec. '29.	About the same as in December, but below Dec. '29.	Collections will be slower than in November, but slightly better than Dec. '29.	Time payment plans of selling replacement heating and plumbing equipment developing business beyond last Spring's expectations.
SHOES	Anticipated increase due to weather. On a par with Dec. '29.	Increase of stocks over November, with slight decrease in retail stocks from Dec. '29.	Little change from November. Retail collections slower, merchant collections improved over Dec. '29.	Merchants look for a large Christmas business in slippers and novelties.

White Presents Six Wheel Line With Four Models

Six new four-cylinder models on four-wheel chassis offered as well as four six-wheel chassis with six-cylinder engines

SIX new four-cylinder, four-wheeled and four six-cylinder six-wheeled truck models have been added to the line of the White Co., Cleveland, Ohio. The four-wheeled trucks all carry the White Model GRCB engine with four cylinders of 4 in. bore and 5¾ in. stroke. This engine has 289 cu. in. displacement and develops 45 hp. at 1800 r.p.m. The six wheelers (the first to be put out by the company) are equipped with White Model IAB six-cylinder engines of 4⅜ in. bore and 5¾ in. stroke which develop 96 hp. at 1800 r.p.m. These trucks embody the Timken Model SW worm-drive rear axle and are designed to carry loads of from 3 to 10 tons.

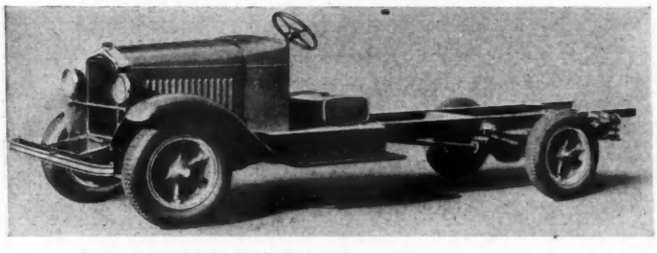
The new four-wheeled four-cylinder trucks are made in two somewhat different lines, three of them having a wheelbase of 138 in. and a rating of 1-2 tons, while the other three have a wheelbase of 148 in. and a rating of 1½-2½ tons. The three models of each group differ among each other only with respect to size of tires, while the differences between the two groups relate to make and size of universal joints, size of rear axle, final reduction, braking area, size of frame and capacity of springs.

The Model GRCB engine is a development of a former White design, Model GRC. It is fitted with a centrifugal governor, which, together with the Zenith carburetor, is located on the left side of the engine, the combustible mixture being carried through a passage through the cylinder block to the inlet valves on the right. The shorter four-cylinder chassis have single-piece propeller shafts with Mechanics universal joints, while the longer chassis have two-piece propeller shafts with three Spicer joints. All rear axles are of the semi-floating type with spiral bevel gear drive, the shorter chassis having a somewhat lighter axle with a reduction ratio of 4.73 to 1, the longer a reduction ratio of 5.67 to 1. Optional reduction ratios can be supplied.

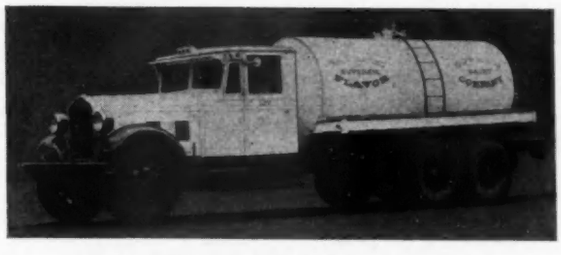
In the shorter trucks the frame side rails have 6 x 2⅝ x 3/16 in. sections, while in the longer ones the side rail section is 6⅝ x 3 1/16 x ¼ in. Service brakes are four-wheel hydraulic actuated through vacuum boosters, while the parking brake acts on a drum directly back of the transmission. The brakes on all of the four-wheel trucks are alike except as regards size, the braking area on the shorter models being 138, and on the longer one, 211 sq. in.

Standard equipment includes a speedometer, an oil gage, an ammeter, front fenders, dash and cowl ventilators, electric horn and lights, a spare rim and a spare-tire carrier.

White's new four-wheel drive, six-wheeled trucks come in three models as follows: Model 59, 7½-10 tons; Model 63, 3 tons; Model 64, 5-7½ tons. Model 64, however, can be fitted with either the SW 200 or SW 300 Timken tandem axle. All of these models employ four Spicer universal joints each, with the exception of Model 59, which has three such joints.



The new White Model 160 is on a four-wheel chassis powered by their GRCB 45 hp. engine

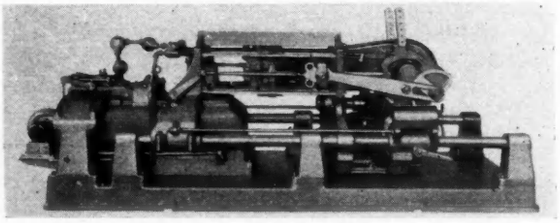


This Model 59A SW 400 has a capacity of 7½ to 10 tons and a 96 hp. engine

NEW DEVELOPMENTS—AUTOMOTIVE

Madison-Kipp Die-Casting Machine

A DIE-CASTING machine, designed for the making of large die castings and a larger range of work, is the latest addition to the line of the Madison-Kipp Corp., Madison, Wis. As an instance of the work that is now being die cast, the Madison-Kipp Corporation recently received an order for dies for casting the frames of typewriters. With the newly designed machine, a commission of this kind can be handled without difficulty.



The new machine is a 12 in. by 16 in. size—in other words, the center distances between the four guide rods which carry the die carriage are 16 in. between the horizontal pairs of rods, and 12 in. between the vertical pairs. Its stroke is 12 in.

Stationary dies up to four and a half inches may be mounted on the hot plate. When more space than this is needed, it can be gained by inclining the parting line of the die, and having the gate run up to the cavity at an incline from the hot plate. As with the movable die member, 16 bolting holes are provided in the hot plate for bolting the fixed die member in position.

All the important bearings of the machine are bronze bushed, and are lubricated by oil tubes running from a Madison-Kipp Lubricator. Where multiple die cavities are operated at high speeds on long runs, the dies may also be automatically lubricated. For the usual type of work, it is customary to blow off the chips with a compressed air nozzle, and this nozzle may also be used as a means of lubrication. The end of the nozzle is first dipped in oil, and when air is turned on to blow the chips from the die, the oil is sprayed onto the die at the same time.

In designing the machine, full provision was made for complete automatic control of the mechanism. All cores are, of course, advanced to and withdrawn from the die automatically. Back of the car and shaft mechanism, which actuates the connecting rods from the main driving shaft to the carriage, there is a second pair of cams which give an oscillatory movement to the two vertical levers extending from the gear box. These levers, in turn, operate bell cranks which advance and pull the cores at the correct point in the cycle of the machine. Of course, this part of the mechanism must be designed and built for the particular die on which it is to be used.

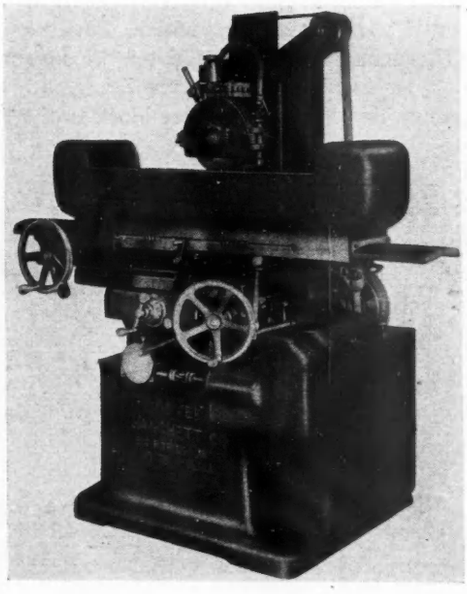
Quick adjustment of the machine for each particular job is provided for. Rack teeth cut in the under side of the main base rails mesh with pinions, turned by hand levers, which move the machine rapidly along the base rails. In this way, the opening of the gate of the die can be quickly brought to position over the nozzle of the gooseneck.

In operation, the machine is fully automatic. Control is through a single lever, which engages a clutch with the electric motor drive. With the four speeds available from the motor, provision is made for making, 2.77, 4.16, 5.55, and 8.33 "shots" per minute. Total weight is about 12,000 lb.

No. 78 Hydraulic Super Surface Grinder

RAPID removal of stock and deep cuts with a high degree of accuracy are outstanding features of the No. 78 Hydraulic Super Surface Grinder recently perfected by the Covel-Hanchett Co., Big Rapids, Mich., for grinding hardened steel dies, chasers, tools, gages, and the like.

The automatic cross-feed is so arranged that the table does not reverse until after the complete action of the cross-feed has taken place. In this way it becomes a shock absorber for the table reverse making a slight pause while the action is taking place. Controls are at the finger tips of the operator so that he can perform all oper-



PARTS, ACCESSORIES AND PRODUCTION TOOLS

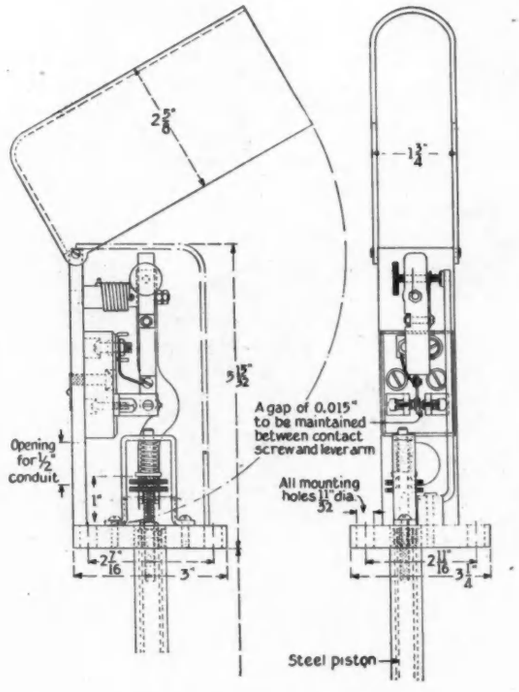
ations without taking a step right or left. The throttle or control valve is so arranged that the large hand wheel at the right is disengaged before power can be applied to the table. Splash guards are specially designed to keep the coolant in at the increased speed of table travel. They are made of cast aluminum and are easily adjusted to the various heights of the work.

Recommended motor size, 3 hp. at 1800 r.p.m. Floor space is 44 x 86 in. Net weight 2950 lb. complete with motor.

G-E Quartz Rod Thermostat For Metal-Melting Pots

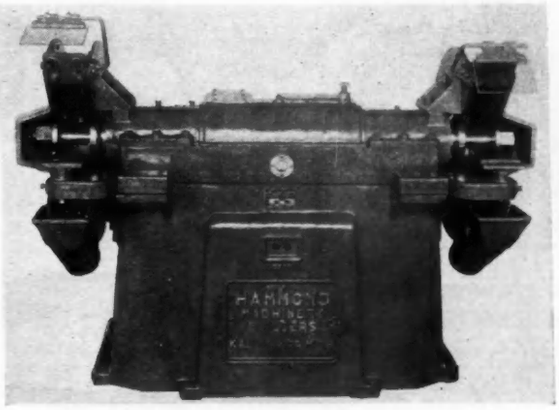
GENERAL ELECTRIC CO., Schenectady, N. Y., offers a quartz-rod thermostat for the control of the temperature of molten lead, tin, solder, babbitt and older low-melting-point metals. The sensitive element consists of a nickel-chrome iron tube surrounding a quartz rod and a steel piston. The quartz rod has a negligible coefficient of expansion. As the temperature increases, the tube is lengthened by expansion and the quartz rod moves down and allows a spring to force the steel piston down. This motion of the piston acts on a lever which in turn controls a circuit. As the temperature decreases, the tube contracts and the action is reversed.

The thermostat comprises an inclosed switch in addition to the nickel-chrome iron tube and quartz rod. This is mounted on a cadmium-plated steel base with four mounting holes. There is an opening for a ½-in. conduit in the back of the switch, which latter also is of steel and cadmium-plated. A die-cast aluminum cover, hinged from the top of the back, completes the inclosure of the switch.



Hammond Select-O-Speed Grinder

A LINE of snagging and heavy duty grinders equipped with 7½, 10 or 15 hp. motors has been added by the Hammond Machinery Builders, Inc., Kalamazoo, Mich. This line of Select-O-Speed grinders affords an almost constant peripheral speed of 9000 surface feet per minute,



which is said to provide maximum grinding efficiency on Bakelite and rubber bonded wheels. The machine also can be arranged for use with vitrified grinding wheels. Wheels of 24 in., 20 in., 18 in. and 16 in. can be used effectively.

Power is transmitted from an accessible but fully protected motor, mounted at the rear, to an intermediate driveshaft by means of Multi-V belt, maximum power being transmitted without slippage. The Multi-V belt can be replaced without disturbing a single member of the machine with the exception of the belt guard. Speeds are changed by means of quick change pulleys on the motor, which are accessible and have protective features so that the faster speeds cannot be operated on the large wheels. Power from the intermediate spindle to the main spindle is transmitted by means of herringbone gears, operating in bath of oil.

Wheel guards are made of boiler plate steel and built in accordance with A.S.A. recommendations. They are adjustable to compensate for wear of the wheel and fitted with shatterless glass eye shields.

Automotive Oddities — By Pete Keenan

THE FIRST AMERICAN TO HEAR THE CRY "GET A HORSE" WAS OLIVER EVANS. HE BUILT THE FIRST AMPHIBIAN CAR, CALLED THE "ERUCTOR AMPHIBOLIS," 140 YEARS AGO.
W.D. EDENBURN, WHO DIRECTS THE GREAT INDIANAPOLIS MOTOR DERBY, CAN'T DRIVE A CAR HIMSELF.
CHECK AN' DOUBLE CHECK
ANDY BROWN, A COLORED MAN, WAS ARRESTED FOR STEALING AN AUTO. New York, May 1930.
THE SHORTEST AND NARROWEST PAVED MOTOR ROAD IN EXISTENCE: LESS THAN A MILE LONG ONLY ONE-CAR WIDTH. Smith's Island, Chesapeake Bay.
A MOTOR-MINDED EAGLE LIT IN JUDGE MATHEWS RUMBLE SEAT AND RODE FOR MILES IN PEACE. Savannah, Ga.
Pete Keenan

NEWS OF THE INDUSTRY

Hayes Body Plant On Six-Day Week

Increased Releases by Three Car Makers Reflected by Supplier

GRAND RAPIDS, MICH., Nov. 24—W. W. Hoagland, president of the Hayes Body Corp., has announced a new employment schedule which calls for a six-day week, instead of four-day, at the Grand Rapids plant. This new schedule will be maintained at least for the remainder of this year, Mr. Hoagland states. The new working schedule resulted from increased body requirements on the part of three manufacturers.

December schedules for Peerless bodies will be 40 per cent greater than in November, according to E. J. Connolly, vice-president of the company. The new Austin roadster will add materially to the schedules on the Austin contract during the next five weeks. There will also be a slight increase in the output of Marmon bodies, according to Mr. Connolly.

The total present payroll of the corporation is 1000 but most of the employees have been working on a part-time basis.

Mathis Ready Jan. 1; Show Space Held

LANSING, Nov. 24—Production on the Mathis, small French automobile, is scheduled to get under way here about Jan. 1, 1931, when assembly lines will be in operation and hundreds of men will be employed, Harry J. Shorter, general sales manager of Durant, has announced.

Plans for manufacture of the Mathis are progressing rapidly. Show space at New York and Chicago has been reserved for the French car as well as for the regular line of Durants.

Salon to Open in N. Y.

NEW YORK, Nov. 24—Following a successful showing at Chicago, the 26th Annual Automobile Salon will open here tomorrow at the Hotel Commodore with about 90 custom bodies exhibited on 16 chassis types. Virtually all the custom body makers exhibiting have duplicated their Chicago showings for the New York event, which will continue until Dec. 6.

The News Trailer

By Herbert Hosking

The **Graham-Paige** plant will resume Dec. 1 (inventory) * * * **Count von Luckner** uses a **Chrysler**-powered **Dart** boat as tender to his "Mopelia" * * * ELECTRIC RUNABOUT STOLEN IN EVANSTON—**Evanston** antique dealers complain to police * * * City of **New York** operates 428 **Fords** out of 849 cars * * * Chicago dealers are closing on Sundays—Philadelphia just 143 years ahead of them on that count * * * **Trenton** (N. J.) School of Industrial Art has closed its rubber technology course. Reason given, "lack of interest" * * * **Lansing** inventor designs wire screens for car windows—one way to keep the **bugs** out of the new models * * * "en los circulos automovilistas hay fundadas esperanzas de que Ford annunciara al publico el ano proximo un modelo de ocho cilindros, motor tipo V, a precio desde $200 hasta $300 por arriba de su modelo actual A," screams the "Mercurio" of **Habana** . . . hope springs **eternal** in the human breast * * * 46 per cent of tires on American automobiles are baldheaded, according to Robert McTammany of Goodrich, predicting increased replacement sales * * * the Kentucky bank situation is better * * * Social note: A middle-aged Pierce body and a slightly younger Stearns chassis were recently married near this office by a member of the art staff. The latest report is that the dear old couple is having a hard time making ends meet (See A. I. specification tables, Statistical Issue, 1914, et seq.) * * * Turkey preferred will declare a big dividend tomorrow.

G.E. Will Assist Workers

NEW YORK, Nov. 24—General Electric Co. will put its unemployment plan into active operation on Dec. 1. This plan calls for the contribution of one per cent of the monthly wage to be given by every employee of the company who is working 50 per cent or more full time and to be matched by equal contributions from the company. From the fund thus raised, $15 a week will be given to employees needing assistance because of having been laid off during the present emergency.

See Normal Jan. 1 at St. Louis Plant

Chevrolet and Fisher Officials Recalling Workers and Increasing Output

ST. LOUIS, Nov. 24—Officials of the Chevrolet Motor Co. and the Fisher Body Corp. are quoted in the press today as stating they expect the local plant to be in normal production by Jan. 1. The plant at present is operating with 2000 men, about one-third normal production, with new models in demand.

Old employees are being recalled as rapidly as production can be increased and approximately 4500 men will be at work Dec. 1. According to A. W. L. Gilpin, regional sales manager, by Jan. 1 it is expected that the full force of 6000 workers will be employed.

Mr. Gilpin said officials denied reports that wages had been cut, stating that the scale for semi-skilled workmen is 77 cents an hour, with top in the body division of $1.10 an hour, the same as was paid previously.

The normal annual expenditure by the company locally is $24,000,000, of which more than $8,000,000 is pay roll, Mr. Gilpin said.

Marmon Signs for C.I.T. Wholesale Finance Plan

INDIANAPOLIS, Nov. 26—Carl J. Sherer, vice-president and treasurer of the Marmon Motor Car Co., has announced completion of arrangements with the Commercial Investment Trust Corp. for a wholesale finance plan to be used by Marmon distributors and dealers throughout the country. The new wholesale finance plan supplements the Marmon-C.I.T. retail plan which was adopted 10 months ago.

G.M.A.C. Reduces Rates

NEW YORK, Nov. 25—General Motors Acceptance Corp. has reduced the flat charge in its wholesale rates to dealers for financing cars in dealers' inventory. The new flat charge ranges from $2.50 per car for Chevrolet passenger cars and trucks to $5 per car for Cadillacs. Interest charges and acceptance of retail contract clauses remain the same as heretofore.

Lincoln Presents Entirely New Line

Will Be Introduced At New York Salon

DETROIT, Nov. 24—A new Lincoln will be shown to the public for the first time when the New York Automobile Salon opens at the Hotel Commodore on Nov. 29. The new model has a much longer wheelbase (145 in.), a more powerful engine (120 hp. instead of 90), a free-wheeling transmission with silent second speed, a wider tread and center of gravity which is said to permit of taking turns at high speeds.

A new carburetor of the downdraft, double-throat type is supplied with fuel by a fuel pump, and a combination air cleaner and silencer is attached to the carburetor intake. A two-plate dry clutch provided with damping means is employed. Brakes are of the two-shoe type and the same four-wheel brakes are operated by both the brake pedal and the emergency lever.

The wheelbase is 9 in. longer than that of the former Lincoln. This added length (one-third of which is in the hood and cowl), the lower bodies, the new pointed radiator and the slanting windshield combine to give the car a fleeter appearance. The greater length, width and depth afford greater roominess within the bodies and particular attention has been paid to the convenience of the driver.

Kari-Keen is Purchased

SIOUX CITY, IOWA., Nov. 24—The Kari-Keen Aircraft Corp., idle since last spring, has been purchased by the C. F. Lytle Investment Co., and Francis Lytle has announced that the plant will be reopened next month or early in January to manufacture a small plane, similar to the coupe formerly manufactured at the plant.

Merle Cornell, who has been superintendent since the plant was established three years ago, will continue in charge, Mr. Lytle has announced.

Murray Rubber Gets Receiver

TRENTON, N. J., Nov. 24—Judge William N. Runyon in the Federal Court at Newark has appointed Alfred A. Branham, vice-president and general manager of the Murray Rubber Co., equity receiver for that concern. The petition stated that although the company is solvent, it has liabilities of $2,495,000 of which $845,000 is due and cannot be paid for lack of ready cash. The Murray Co. was organized in 1922.

Autogiro Production Begins

PHILADELPHIA, Nov. 24—Commercial production of the Pitcairn Autogiro is now definitely under way, according to Edwin T. Asplundh, vice-president and general manager of Pitcairn Aircraft, Inc., Willow Grove, Pa.

Financial Notes

Chicago Yellow Cab Co. has declared regular monthly dividends of 25 cents, payable, respectively, Jan. 2, to holders of record Dec. 19, Feb. 2, to holders of record Jan. 20 and March 2 to holders of record Feb. 20.

Hudson Motor Car Co. has declared regular quarterly dividend of 75 cents, payable Jan. 2, to holders of record Dec. 11.

Automotive Gear Works has declared regular quarterly dividend of 41¼ cents on preferred, payable Nov. 20 to holders of record Dec. 1.

General Parts Corporation for the third quarter of 1930 reports a profit of $36,589, after charges but before Federal taxes, as compared with $61,016 in the preceding three months and $43,944 in the first quarter this year. Profits for the nine months amounted to $141,549, after the same charges.

Electric Storage Battery Co. has declared regular quarterly dividend of $1.25 on common and preferred, respectively, both payable Jan. 2 to holders of record Dec. 9.

Kelsey Hayes Wheel Corp. has declared regular quarterly dividend of 50 cents a share payable Jan. 2 to holders of record Dec. 19.

Motor Finance Corp. has declared regular quarterly dividend of 25 cents and an extra dividend of 25 cents, both payable Nov. 29 to holders of record Nov. 22.

Dismantles Buffalo Plant

BUFFALO, Nov. 24—Machinery in the plant formerly owned by the Wire Wheel Corp. of America at 1700 Elmwood Avenue, which was acquired by the Kelsey-Hayes Wheel Co. more than a year ago, is being dismantled, and will be moved to Detroit before Jan. 1, to be combined with the Kelsey-Hayes plant.

H. Gardner Jackson, who was formerly president of the Wire Wheel Corp., has resigned as vice-president of Kelsey-Hayes Wheel, and Frederick L. Rowe, formerly secretary and treasurer of Wire Wheel, has resigned as assistant secretary of Kelsey-Hayes. Mr. Jackson will retain his position as director of the company.

Protects Gasoline Buyers

STOCKTON, CALIF., Nov. 24—The City Council here has passed an ordinance compelling distributors of low-test or cut-rate petroleum motor fuel to post signs on their pumps reading "This is not gasoline." All dealers selling a product not complying with the standards established by the United States Government for gasoline will be regulated by the new measure. Similar ordinances have been placed in effect in Los Angeles and Fresno, Calif.

Thermoid Acquires Option

TRENTON, N. J., Nov. 24—The Thermoid Rubber Co. has acquired an option on the Woven Steel Hose Co., Trenton, and will close out the purchase within a short time. Joseph O. Baur, secretary-treasurer of the Thermoid company, announced that the purchase met with the approval of the Thermoid stockholders. The Woven Steel Hose Co. manufactures air hose and automobile accessories.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Nov. 26—As the period for taking inventories approaches, wholesale and jobbing lines show signs of slackening. Some branches of general trade are fair, while others are slow. There were a few more bank suspensions in the West and South last week, and in many of these cases it is reported that the failures have been due to frozen loans or overtrading in land. On the whole, the sentiment in business quarters is fairly optimistic, and many authorities are of the opinion that the business recession is at or near the bottom.

CORPORATE PROFITS

Aggregate profits of more than 600 corporations during the first nine months of this year, according to one acounting house, were about 24 per cent below those in the corresponding period last year. During the third quarter of this year, the profits of these corporations were 26 per cent less than in the preceding month and about 51 per cent less than in the corresponding quarter last year.

CAR LOADINGS

Railway freight loadings for the week ended Nov. 8 totaled 881,401 cars, which marks a decrease of 167,567 cars below those a year ago and 172,952 cars below those two years ago.

MERCHANDISE EXPORTS

Merchandise exports during October mounted to $328,000,000, as against $312,014,000 during the preceding month and $528,514,000 a year ago. Imports amounted to $248,000,000, as against $226,326,000 during the preceding month and $391,063,000 a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Nov. 22, stood at 80.8, as against 82.2 for both the week and two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Nov. 19 were 26 per cent below those in the corresponding period last year.

STOCK MARKET

The stock market in the beginning of last week showed some lack of strength but revived toward the end of that period. Trading was on a moderate scale. During the earlier part of the week a number of issues made new lows for the year, but as a rule most issues registered slight net gains for the week.

BROKERS' LOANS

Brokers' loans in New York City during the week ended Nov. 22 decreased $50,000,000. The total contraction for the eight weeks ended Nov. 22 was $1,037,000,000.

New Stutz Models Have "8" Engine

Three Series Offered At Wide Price Range

INDIANAPOLIS, Nov. 26—The recently announced Stutz Twentieth Anniversary models cover a price range from $1,995 to $10,800, according to E. S. Gorrell, president.

The 1931 line is offered on three chassis series known as the LA of 127½ in. wheelbase; MA of 134½ in. wheelbase and MB of 145 in. All three series are powered with the improved Stutz straight eight motor with overhead cam. The LA series prices range from the base of $1,995 to $2,785, the MA from $3,445 to $3,795 and MB $3,595 to $10,800.

The bodies for the new models include some of the newest coachcraft. Weymann, Le Baron, Dunn, Derham and Fleetwood are represented. The chassis design, while adhering to the fundamentals which have been features of Stutz for some time, presents some interesting new developments.

The four-speed transmission retained in all models has been redesigned for greater ease of operation. The newest type of Gabriel three-way shock absorber is found on all models and also an improved type Gemmer steering gear. All chassis bearing surfaces are lubricated by a Bijur centrally controlled chassis lubricating system.

Running boards have been redesigned with a gracefully curved edge to harmonize with the contour of the new fenders which are wider and sturdier. The timing chain is used to drive the fan. Automatically controlled radiator shutters have been made standard equipment on all models. The Stutz undershot worm drive has been retained throughout the line.

Austin Adds Workers

BUTLER, PA., Nov. 25—The American Austin Car Co., Inc., today added 100 men to the payroll and officials announced that 40 automobiles will be produced daily until Jan. 1.

Set Sioux City Show Date

SIOUX CITY, IA., Nov. 24—Date of the Sioux City automobile show has been advanced to Dec. 18-20 by officials of the Motor Trades Bureau of the Chamber of Commerce. J. V. Thorndike was made manager.

Keystone Changes Policy

BRISTOL, PA., Nov. 24—George H. Prudden, aeronautical engineer since 1911, has been put in charge of all metal design and development at the Keystone Aircraft Corp., according to an announcement by Edgar N. Gott, president.

The appointment of Stanley W. Jacques to the position of manager of commercial sales in charge of marketing Keystone-Loening Air Yachts and Amphibions has also been announced. By this change, all sales of these planes will in future be handled directly from the factory instead of through the Curtiss-Wright Sales Corp. in New York.

Ford Plans Mexican Plant

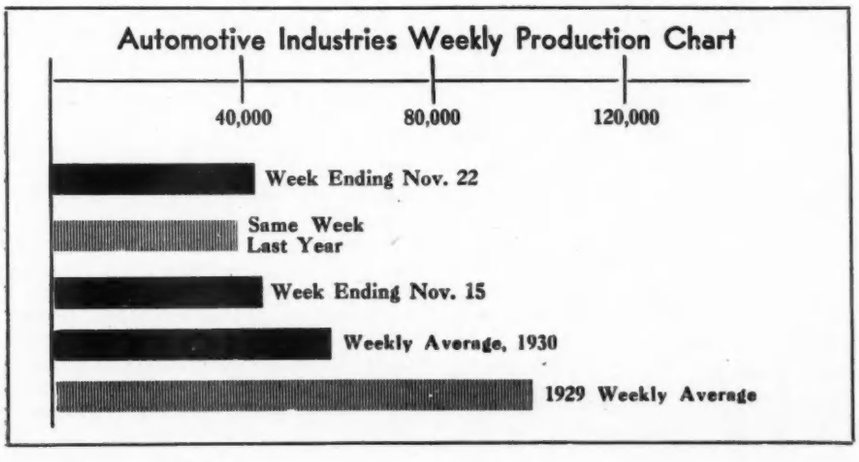
MEXICO CITY, Nov. 24—The Ford Motor Co. announced Nov. 17 that work would begin in December or January on a Mexico City assembly plant, capable of turning out 100 cars daily.

Adrian Lajous, in making the announcement, said the investment would be more than $1,000,000. Cars would be sold henceforth for silver pesos. All materials purchased in Mexico will be paid for in silver.

The minimum wage will be raised to eight pesos, a little less than $4 a day.

Upholds County Sales Levy

ATLANTA, Nov. 25 — Automobile salesmen must pay tax in each county, other than their resident county, in which any solicitation is made, according to a recent ruling of the Georgia Supreme Court. The decision followed appeals from cases in which county authorities had collected taxes from automobile dealers selling cars in that county and maintaining agencies in another county.



Service Parts Index Shows Improvement

Accessory Business Also Better During October

NEW YORK, Nov. 25—Service parts and accessories furnish the high spot for the industry supplying the automotive manufacturers and trade for the month of October, according to index figures prepared by the Motor and Equipment Association.

The index for service parts for the month of October, based on January, 1925, as 100, is 140, as compared with 139 in September and with 166 a year ago. Accessories established an index of 79, as compared with 76 in September and with 91 a year ago.

Reduced schedules of automobile production during November are clearly shown in the original equipment index for October, which is 75, as compared with 79 in September and with 160 in October of last year.

Service equipment index dropped to 99 during the month, as compared with 105 in September and with 147 in October, 1929. The entire industry thus shows an index of 86, as compared with 89 for September and with 156 for October of last year.

As might be expected from the shipments of manufacturers in the replacement parts and accessory groups, wholesalers during the month showed a marked improvement over the previous month, nearly equaling the volume of business handled in October of last year. Their index for the month, based on January, 1928, as 100, is 155 as against 120 in September and 156 in October of last year.

Together with the increase in volume of business handled, jobbers report an increase in accounts receivable but this increase is nowhere near proportional to the increase in volume of business and the October index still falls considerably below the October index for accounts receivable a year ago, showing that jobbers have been much more careful in extending credits and in making collections this year than last.

Quebec Revenue Increases

QUEBEC, Nov. 24—Total receipts brought the Province of Quebec for the fiscal year ended June, 1930, as applied to the Motor Vehicle Act, the sum of $9,395,689, an increase for the year of $1,261,910 over the previous year. The $9,395,689 is made up of $5,423,650 from the motor vehicle tax and $3,972,038 gasoline tax, and the increase is on both items.

Platform Specifications Accepted

WASHINGTON, Nov. 27—The required degree of acceptance having been received, the revised simplification program covering skid platforms has been declared to be in effect, according to the Division of Simplification, Bureau of Standards.

Men of the Industry and What They Are Doing

Sikorsky Elects Rentschler

Sikorsky Aviation Corp., subsidiary of United Aircraft & Transport Corp., has elected Frederick B. Rentschler as chairman of the board, succeeding Arnold C. Dickinson, who has resigned because of ill health. George S. Wheat has been elected a director to succeed W. A. Bary, resigned, and F. W. Neilson has been appointed sales manager, succeeding W. W. Cowgill.

Dodge Appoints Stanton, Bamford

D. T. Stanton has been appointed director of service for Dodge Brothers Corp., and W. R. Bamford as assistant to the director of service. Mr. Stanton was formerly a director of sales.

Dibois Returns to Peru

Aeduardo Dibois, president of the Touring Club of Peru and former president of the Association of Automobile Manufacturers of Peru and now automotive manager of Graham-Rowe Co. of Lima, importers of Hudson-Essex cars, Republic trucks and tires, sailed today on the Santa Clara to return to Peru after an extensive visit in this country. While here Mr. Dibois visited the International Road Congress after which he held extensive conferences with the companies he represents.

Samson to Attend Show

Emil Samson, president of the Automobile Dealers Association of Sweden and vice-president of the Royal Automobile Club, is among the first to accept an invitation to attend International Day exercises to be held in connection with the New York automobile show this coming January. Mr. Samson is Nash distributor for Sweden.

Hudson Men Return

Four factory representatives of the Hudson Motor Car Company's export staff arrived in Detroit last week to inspect the new Hudson and Essex models, which will be introduced the latter part of this month. The men are: A. R. Jones, representative in Australia and New Zealand; J. R. Borden, whose territory includes practically all civilized Africa; H. V. Whelan, Far East, and C. B. Thomas, South American representative.

A.S.M.E. Discusses Airplane Safety

NEW YORK, Nov. 24—The American Society of Mechanical Engineers held a meeting on Aviation Safety in the auditorium of the Engineers Building here last week. Floyd S. Prothero of the Travels Insurance Co. spoke on aviation safety from the insurance company's point of view. Carl B. Fritsche, president of Aircraft Development Co., builders of the metal clad airship, spoke on the features of both safety and economy of the lighter-than-air ship. He gave a number of interesting figures on the economics of transport by this means as compared with other means of freight handling.

Autocar Has New Model

ARDMORE, PA., Nov. 24—Especially designed for oil field work, Autocar's new five-ton chassis, designated as Model CG, is equipped with a six-cylinder engine, twelve-speed transmission, Timken tandem rear and six-wheel air operated service brakes. This new unit has a 196 in. wheelbase, is equipped with 36 x 8 in. pneumatic tires, dual rear, and is capable of making 33 miles per hour on a full load.

The frame of pressed alloy steel is unusually large being 9 x 3 x ¼ in. in size. Power developed by the 4½ x 4¾ in. engine is transmitted through a double plate Long clutch, 12-speed transmission which is mounted amidships.

Hudson Prices Announced

DETROIT, Nov. 24—Hudson Motor Car Co. have announced prices on their 1931 Hudson and Essex models as follows:

Essex

Model	New Price	Old Price	Lower	Higher
Business Coupe..	$595	$650	$55	...
Coach	595	650	55	...
Coupe — rumble seat	645	685	40	...
Standard Sedan..	695	715	20	...
Sport Roadster ..	725	695	..	$30
Touring Sedan ..	775	775	..	...
Chassis	530	...	..	...
Comm. Chassis ..	435	...	..	...

Hudson

126-in. Wheelbase

Model	New Price	Old Price	Lower	Higher
Touring Sedan ..	$1,145	$1,145	..	...
Brougham	1,195	1,195	..	...
Family Sedan ...	1,195	...	..	...
7-Pass. Phaeton..	1,295	1,160	..	$135
Club Sedan	1,445	...	..	...
7-Pass. Sedan ...	1,450	1,295	..	155

119-in. Wheelbase

Model	New Price	Old Price	Lower	Higher
Business Coupe..	$875	$885	$10	...
Coach	895	895	..	...
Rumble Seat Coupe	925	925	..	...
Town Sedan	945	...	..	...
Sport Roadster ..	995	995	..	...
Standard Sedan..	995	1,025	30	...
5-Pass. Phaeton..	1,095	965	..	$130
Chassis	825	...	..	...

Steel Quotations Set To End Price Shading

Copper Market Recedes; Lake Business Dull

NEW YORK, Nov. 26—In furtherance of the steel market's stabilization program (which was fully outlined in last week's issue of *Automotive Industries*, but which came in for more general attention this week because of belated first-page newspaper publicity), the leading interest's sheet-rolling subsidiary announced on Monday minimum prices for first quarter 1931 sheet business. This action follows recent announcement of minimum prices for heavy rolled products: bars, shapes, and plates by another of the Corporation's subsidiaries.

These minimum prices, far from entailing advances, take cognizance of some extremely low quotations by independents, especially so on full-finished automobile sheets. The only interpretation that can be placed upon these minimum price announcements is that they are intended to arrest further price-cutting by the smaller mills. As for putting across actual price advances, the steel market waits upon developments to furnish support for such upward revision.

Copper has receded to 10½ cents, delivered Connecticut, or 10⅝ cents, delivered Middle West. This is the price for electrolytic. Lake copper producers are holding to the semi-official price of 12 cents, but, of course, business in Lake copper is virtually at a standstill. The Cerro de Pasco mine in Peru, one of the largest producers, has shut down because of civic disturbances in that country. A large refinery at El Paso, Texas, has cut output from 8500 to 6600 tons per month. It will be some time yet, in the opinion of prominent consumers, before these and other measures of curtailment of output will offset the market's burden of heavy surplus stocks.

Pig Iron—Middle West automotive foundries are showing more interest in the market. The Michigan price is $17.50 @ $18. The Valley market is $17 @ $17.50, furnace, and Lake furnaces quote $16 @ $17, furnaces.

Aluminum—Aluminum foundries show a somewhat better stride in their operations. The market for virgin metal is unchanged and steady. Remelt metal prices are holding their own.

Tin—Dull. Straits tin was offered at 25⅞ cents at the beginning of the week.

Lead—Quiet and unchanged.

Zinc—Prime Western is quoted at 4⅛ @ 4¼ cents, East St. Louis, with consumers offish.

Schon Talks to Buffalo Section

BUFFALO, Nov. 24—Lack of uniformity in the legislative measures enacted by different states on motor vehicles and excessive license fees and taxation form the two greatest obstacles to the development of motor transportation, Pierre Schon, transportation engineer for the General Motors Truck Co., Lansing, Mich., told the members of Buffalo Chapter, Society of Automotive Engineering, at their November meeting.

Commercial Body Makers Complete Organization

Will Convene in St. Louis Jan. 14-15

DALLAS, TEX., Nov. 24—The National Commercial Body and Equipment Association completed its organization work at a convention in St. Louis in October, and is ready to proceed toward the accomplishment of its purpose, according to an announcement from A. A. Ritcheson, president of the association and of the American Body Co., Dallas.

Three classes of membership in the association have been established. Active members will be those engaged in the manufacture of commercial bodies; associate members will be those who supply parts and materials to the plants of the active members, and auxiliary members will be those engaged in the manufacture of steel dump bodies, six-wheel units, trailers and other auxiliary equipment sold through jobbers.

The object of the association will be to obtain for its members an equitable share of the commercial automobile body business, which is said to show a tendency to be deflected into a few national manufacturing and distributing channels.

A second convention of the association is scheduled to be held in St. Louis, Jan. 14-15. Officers of the association in addition to Mr. Ritcheson are: first vice-president, J. R. Finney, general body works, Fort Smith, Ark.; second vice-president, Fred Anheuser, Body Division of Anheuser-Busch Co., St. Louis; secretary, Jonathan W. Teal, Omaha; treasurer, A. C. Prucha, San Antonio Body Co., San Antonio, Tex.

A.P.I. Elects Officers

NEW YORK, Nov. 24—The list of officers elected at the annual meeting of the American Petroleum Institute is announced by the Institute as follows: president, E. B. Reeser, Barnsdall Corp., Tulsa, Okla.; vice-president at large, L. P. St. Clair, Union Oil Co., of California, Los Angeles, Calif.; vice-president for production, Robt. R. Penn, Penn Oil Co,. Dallas, Texas; vice-president for refining, R. C. Holmes, The Texas Co., New York; vice-president for marketing, E. G. Soubert, Standard Oil Co. (Indiana), Chicago; executive vice-president, W. R. Boyd, Jr., American Petroleum Institute, New York; treasurer, A. L. Beaty, New York; and secretary and assistant treasurer, Lacey Walker, American Petroleum Institute, New York.

Conducts Trucking Survey

WASHINGTON, Nov. 27—In cooperation with the Bureau of Public Roads, Department of Agriculture, the Transportation Division, Department of Commerce, is making a survey of motor trucking.

Extent of Railroad Participation in Motor Carrier Operations Told at I.C.C. Hearing

ST. LOUIS, Nov. 24—The extent to which major railway companies of the United States have gone into the motor bus business is disclosed by statistics forming a preliminary basis for the national investigation by the Interstate Commerce Commission, designed to result in recommendations to Congress for Federal supervision of motor buses and trucks and their coordination with rail facilities.

The figures, compiled by the commission from a questionnaire answered by all roads with an annual operating revenue of more than $1,000,000, indicate a property investment of about $40,000,000 in motor buses, trucks and equipment, and a growth of facilities so great they quadruple these of three years ago.

Regional statistics of major railroads, summarized by the commission, show that bus and truck subsidization is national in scope. The property investment in railway operated bus lines in this southwestern region totals $5,464,248, representing expenditures of the Missouri Pacific, the cotton belt, the Texas and New Orleans and the Texas and Pacific Railways.

These bus lines played their part in the national statistics by carrying 1,245,612 passengers, 87,411 of them interstate passengers, the first six months of this year. Intrastate routes totaled 5528 miles while interstate routes covered 2778 miles. More than 410 buses are operated. Motor truck activities of railroads indicate a corresponding development, being used principally for transporting less than carload lots on short hauls.

There remain thousands of buses operated by smaller railroads and independent motor bus companies, some of them transcontinental in scope, besides the operations of trucking companies covering several states, all coming under the province of Federal regulation due to their interstate activities. The modern transportation picture is complicated by numerous "wild cat," motor vehicle operators and varying regulations in different states.

Operating data indicate the principal railroads ran 2887 buses during the first six months of this year, as compared with 745 buses in 1927. Bus miles: i.e., the number of miles traveled rather than the length of the routes, totaled 58,707,886, more than twice the 23,725,222 recorded during the entire year of 1927.

Intrastate routes totaling 33,187 miles were operated by railroads the first half of this year, as well as 23,040 miles of established interstate routes. Intrastate passengers carried by railroad buses during this period were 34,113,361, while 5,090,561 interstate passengers were transported. Data on passenger traffic three years ago was not available, but witnesses at the St. Louis inquiry testified operations were in their infancy then.

Besides hauling passengers by motor bus, the railroads have engaged in freight business, establishing trucking subsidiaries. Three years ago 141 trucks and 34 trailers were operated. Today more than 550 trucks and 110 trailers are employed.

Trucks operated by railroads recorded 979,251 truck miles in 1927, but during the first half of this year they rolled up a total of 3,211,233 truck miles.

Intrastate route miles grew from 1985 miles in 1927 to 8863 miles as of June 30 last, while interstate routes increased from 385 to 1546 miles. Tons of freight hauled in 1927 totaled 348,718, while 413,259 tons were handled the first six months of 1930.

October Employment Drops

DETROIT, Nov. 25—In the automobile industry in Michigan as of Oct. 15, there were 162,411 employees, a decrease of 32,833 from a total of 195,244 in December, 1929, according to report of State Department of Labor and Industry, based on reports of 49 companies.

Aggregate weekly payroll for the automobile industry in the state during October was $4,451,334, compared with $4,562,084 in September and $5,093,573 in December, 1929. Average weekly earnings per capita was $27.40 October, $27.14 September and $26.80 December.

Federal Screw Reports Loss

CHICAGO, Nov. 24—Federal Screw Works for the quarter ended Sept. 30, last, reports a net loss of $49,863 after all charges, as compared with a net income of $235,344, or $1.48 a share on 159,000 shares in the third quarter last year. For the first nine months this year the net income amounted to $240,480, equal to $1.51 a share, compared with $775,859, or $4.88 a share, in the corresponding 1929 period.

Cadillac Distributors Meet

DETROIT, Nov. 29—Cadillac distributors from a number of territories met at the factory last Monday with J. C. Chick, general sales manager, inaugurating a series of factory-distributor conferences to be held at the home office.

Postpone Borg-Warner Meeting

CHICAGO, Nov. 24—The meeting of directors of Borg-Warner Corp. scheduled for Nov. 28 has been postponed to Dec. 5, due to the proximity of the originally scheduled meeting to Thanksgiving day.

Exports, Imports and Reimports of the Automotive Industry for October of Current Year and for Ten Months Ended October, 1930-1929

	Month of October				Ten Months Ended October			
	1930		1929		1930		1929	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories	..	$14,542,352	..	$32,797,056	..	$248,055,420	..	$488,180,510
Electric trucks and passenger cars	1	4,199	7	12,395	31	58,446	132	199,434
Motor trucks and buses except electric (total)	4,079	2,677,301	11,512	7,090,787	73,801	49,280,090	173,964	98,572,414
Up to one ton inclusive	1,827	846,576	8,282	3,658,000	29,070	15,390,921	133,236	57,887,695
Over 1 and up to 2½ tons	2,063	1,471,119	2,877	2,673,449	41,044	26,316,043	37,740	33,104,246
Over 2½ tons	189	359,606	353	759,338	3,687	7,573,126	2,988	7,580,473
PASSENGER CARS								
Passenger cars except electric (total)	7,136	4,966,015	19,931	14,468,777	137,934	96,238,038	311,683	213,584,091
Low price range $1,000 inclusive	5,281	2,563,920	13,620	7,060,744	100,072	50,432,904	236,381	120,911,462
Medium price range $1,000 up to $2,000	1,548	1,695,107	5,602	5,763,245	33,089	34,403,336	66,436	71,543,217
High price range over $2,000	307	706,988	709	1,644,788	4,773	11,401,798	8,866	21,129,412
PARTS, ETC.								
Parts, except engines and tires	..	..	..	..	..	..	..	..
Automobile unit assemblies	..	3,469,661	..	5,729,804	..	54,619,444	..	99,342,468
Automobile parts for replacement (n.e.s.)	..	2,881,257	..	4,415,685	..	36,881,047	..	57,608,742
Automobile accessories	..	370,774	..	628,356	..	4,864,264	..	8,323,686
Automobile service appliances (n.e.s.)	..	269,102	..	668,596	..	5,358,208	..	6,456,895
Trailers	31	21,284	131	56,535	1,186	553,058	893	419,366
Airplanes, seaplanes and other aircraft	9	121,710	24	353,027	260	386,792	294	4,706,463
Parts of airplanes, except engines and tires	..	191,216	..	159,029	..	1,944,914	..	1,785,544
BICYCLES, ETC.								
Bicycles	222	5,357	362	8,747	3,374	89,934	4,434	116,743
Motorcycles	430	107,769	789	177,756	9,725	2,273,816	14,321	3,227,614
Parts and accessories, except tires	..	59,775	..	77,700	..	871,046	..	946,005
INTERNAL COMBUSTION ENGINES Stationary and Portable								
Diesel and Semi-Diesel	35	64,698	69	107,421	271	803,219	694	1,015,140
Other stationary and portable:								
Not over 10 hp.	1,185	94,597	3,036	267,646	22,499	1,684,130	31,115	2,712,451
Over 10 hp.	70	46,692	348	218,741	3,971	2,197,983	3,958	2,019,725
Automobile engines for:								
Motor trucks and buses	15	4,619	148	38,074	19,078	1,576,013	7,898	1,104,255
Passenger cars	1,115	105,753	3,180	330,166	39,772	3,855,246	84,022	8,724,893
Tractors	6	5,088	42	23,594	248	105,071	795	267,784
Aircraft	40	191,965	20	94,108	334	1,481,308	285	1,221,198
Accessories and parts (carburetors)	..	219,331	..	313,399	..	2,989,514	..	3,690,670
IMPORTS								
Automobiles and chassis (dutiable)	87	83,800	108	121,432	549	758,088	633	1,034,887
Other vehicles and parts for them (dutiable)	..	78,196	..	78,196	..	347,017	..	1,628,601
REIMPORTS								
Automobiles (free from duty)	44	43,222	56	80,240	284	275,041	420	537,639

Campbell Expected to Try

DAYTONA BEACH, FLA., Nov. 25—Captain Malcolm Campbell, noted British automobile racer, is expected shortly to cable his acceptance of Jan. 26 to Feb. 7 as date of the annual international speed trials on the hard-packed sand beach here. Campbell is the only assured entry thus far, although others considered possible are Peter De Paola, U. S., who announced last summer he planned to assault the Segrave mark of 231 m.p.h., and H. A. Patterson, motorcycle racer, who is understood to be perfecting a car with separate motors geared to each wheel. Campbell has built a Napier-powered car for his third attack. It is the Bluebird II, theoretically geared to 300 m.p.h.

Murray Body Adds to Schedules

DETROIT, Nov. 24—Murray Body Corp. of America is now employing 6700 workers, 5500 of which were employed during September, according to recent announcement.

The announcement further stated that November production had increased 50 per cent over September and 30 per cent over October. Present operations average 50 hours per week per man.

Lincoln Sells 863

DETROIT, Nov. 24—Sales of Lincoln cars during September and October totaled 863, of which 489 were sold in September and 374 in October, according to announcement by Lincoln Motor Co. The September total was largest since last May. Preliminary reports for the first 10-day period in November indicate that the volume is being maintained.

Wickwire Plans Reorganization

NEW YORK, Nov. 24—The Wickwire Spencer Steel Co. reports that the plan for reorganization has neared realization to the extent of deposit of more than 77 per cent of seven per cent bonds, 84 per cent of Class A notes and 86 per cent of the Class B notes. Reorganization will be declared operative when, in the opinion of the committee, sufficient deposits have been made.

British Tire Exports Gain

WASHINGTON, Nov. 24—Exports of automobile casings from United Kingdom to foreign countries during the first nine months of 1930 numbered 1,105,701, an increase as compared with the figures for the same period of 1929 which showed 919,802 casings exported. Italy, British India, France, Irish Free State, British South Africa, Netherlands, New Zealand and Argentina were the leading markets during the first nine months of 1930 in the order named.

N. J. Rubber Manufacturers Meet in Trenton

TRENTON, N. J., Nov. 24—The Rubber Manufacturers Association of New Jersey held its fall meeting and dinner at the Trenton Club in October. A. V. Viles, of New York, general manager of the Rubber Association of America, was the guest and spoke on the rubber situation.

Durant Has Pullman Models

LANSING, Nov. 24—Announcement of a new Pullman attachment as standard equipment on Durant four-cylinder 6-10 models and six-cylinder 6-12 models was made this week by Harry J. Shorter, general sales manager of Durant Motors, Inc.

The new feature is concealed and in appearance the cars are similar to any others. By releasing a lever the interior is transformed into a sleeping compartment convenient for tourists and traveling men who desire to sleep in their cars.

The new creations are on the two models at present at no extra cost to the purchaser. They were introduced in Cleveland recently, and as a direct result 32 cars were sold in two weeks, Mr. Shorter said.

White Adds 2 Buses

CLEVELAND, Nov. 24—Two six-cylinder buses, a 16-21 passenger payenter and a 16-passenger highway coach, have been added to the White Co. line.

These new buses are mounted on the new Model 613 bus chassis. The payenter and highway coach bodies are Bender products.

Thompson Books Orders

CLEVELAND, Nov. 25—Thompson Products, Inc., reports receipt of orders for 200,000 valves from the International Harvester Co. Other valve orders received this month were from Chrysler, Marmon and Oakland.

Sales of replacement parts are slightly above those for October.

Michigan Sales Slump Heavily

Ford Takes 44% of October Business

DETROIT, Nov. 24—New passenger car registrations in the state of Michigan during October totaled 4989, a decrease of 3576 or approximately 42 per cent from the total of 8565 registered in September and a decrease of 6903 or 58 per cent from the October, 1929, total of 11,892.

Ford registrations in Michigan last month—representing almost 44 per cent of all makes—were 2188, a decrease of 1478 or 40 per cent from the September Ford total of 3666, and a decrease of 2241 or slightly more than 50 per cent from the Ford October, 1929, total.

Chevrolet passenger car registrations last month totaled 899. Buick was third with 392; Plymouth fourth with 133; Essex fifth with 125; Pontiac sixth with 90 and Oldsmobile seventh with 77.

Total commercial car registrations in Michigan last month were 1122, a decrease of 516 or 31 per cent from the total of 1638 in September and a decrease of 993 or more than 46 per cent from the total of 2115 for October, 1929. Ford showed a total of 780 as compared with 1032 in September and with 1127 in October, 1929. Chevrolet was second with 187 and Dodge third with 41.

Maccar Adds Five Tonner

SCRANTON, PA., Nov. 24—Smart front end appearance characterizes the new five-ton, air-brake-equipped truck recently added to the line of the Maccar Truck Co.

The standard wheelbase is 130 in., although a maximum wheelbase of 215 in. is available. Power is furnished by a six-cylinder 4⅝ x 4¾ in. Hercules engine developing 106 hp. at 2400 r.p.m. An amidships mounted Brown-Lipe Model 60 transmission provides seven speeds. Other major units include: Stromberg carburetor, Delco-Remy electrical equipment, full-floating worm drive Timken rear axle providing a final reduction of 7.8 to 1 and Ross steering gear.

Raybestos Reports Earnings

NEW YORK, Nov. 24—Raybestos-Manhattan, Inc., reports net profit for the nine months ended Sept. 30 of $951,976. This is equivalent after all charges to $1.41 a share and compares with $3,108,919, or $4.60 a share, for the corresponding period of last year.

Earnings for the third quarter were $126,477, or 19 cents a share, as compared with $1,010,390, or $1.49 a share, for the corresponding quarter of last year. Regular quarterly dividend of 65 cents a share was declared, payable Dec. 15 to holders of record Nov. 29.

EVENTS DURING NEW YORK SHOW WEEK

Pierce-Arrow, Luncheon, Plaza Hotel, Jan. 3
Franklin Mfg. Co., Luncheon, Commodore ..... Jan. 5
Packard Motor Car Co., Luncheon, Roosevelt, 12.15 noon ..... Jan. 5
Nat'l Asso. of Show & Asso. Mgrs., Luncheon, Roosevelt, 12.30 noon, Jan. 6
Auburn Automobile Co., Luncheon, Commodore ..... Jan. 6
Marmon Motor Car Co., Luncheon, Commodore ..... Jan. 7
Willys-Overland Co., Banquet, Commodore ..... Jan. 8
Olds Motor Co., Dinner, Hotel Astor, Jan. 8

EVENTS DURING CHICAGO SHOW WEEK

Pierce-Arrow, Luncheon, Stevens..Jan. 26
Franklin Mfg. Co., Luncheon, Blackstone ..... Jan. 26
Auburn Automobile Co., Luncheon, Stevens ..... Jan. 27
Packard Motor Car Co., Luncheon, Blackstone, 12.15 noon .....Jan. 27
Nat'l Asso. of Show & Asso. Mgrs., Luncheon, Palmer House, 12.30 noon ..... Jan. 27
Marmon Motor Car Co., Luncheon, Palmer House ..... Jan. 28
Olds Motor Works, Dinner, Congress, Jan. 28
Willys-Overland Co., Banquet, Palmer House ..... Jan. 29

Bendix Starts Service Chain

CHICAGO, Nov. 24—Establishment of a nation-wide organization for servicing Bendix brakes and Stromberg carburetors was announced today by the Bendix Service Corp., a subsidiary of the Bendix Aviation Corp.

The United States has been divided into zones with headquarters in various key cities. Each zone headquarters is designated as an "A" station and operates as a factory branch. It will grant franchises to automotive service shops, one-stop service stations and brake and ignition specialists in its territory. These will be termed "B" stations and will be individually owned.

Chevrolet Reduced in Canada

OSHAWA, Nov. 24—Price reductions of $60 to $80 on the various models of the Chevrolet Six Car were announced here today at the executive offices of General Motors of Canada, Ltd., by Wm. C. Herring, assistant general manager in charge of sales. The models affected and the amount of the reduction in each case follow: Roadster delivery, $75; roadster, $60; sport roadster, $60; coupe, $60; sport coupe, $75; coach, $60; club sedan, $75; sedan, $75; sport sedan, $75; utility express truck, $60; utility express truck with cab, $80; commercial chassis, $60.

To Expand Foundry

CANTON, OHIO, Nov. 24—Plans for the immediate enlargement of the plant of the United Engineering & Foundry Co., Canton, Ohio, manufacturers of high-grade automotive castings, will be carried out immediately upon the city council granting the company's plea that a city alley be closed to permit the expansion. The company plans to spend $400,000 in erecting and equipping new buildings.

Tire Dealers Reduce Stocks of Casings

More Sources Report Less Than 50 Units

WASHINGTON, Nov. 24—The average stocks of tire dealers reporting to the Rubber Division of the Bureau of Foreign and Domestic Commerce on Oct. 1, 1930, were generally smaller than those reported on the corresponding date in 1929, according to *Domestic Commerce*. Average stocks of all casings, of high-pressure casings, of inner tubes and of solid tires, etc., were 62.4, 89.2 and 22.7, respectively, as compared with 68.4, 22.9, 103.4 and 24.2 a year ago.

A greater percentage of dealers this year reported less than 50 casings in stock, and more dealers were concentrating sales efforts on one make of tires than in preceding years. Less than 30 per cent of the tire dealers handling only one make of tires reported selling automobiles, while over 50 per cent of the dealers handling more than one make sold automobiles as well.

The percentage of tire dealers reporting selling automobiles declined from 39.2 per cent on Oct. 1, 1929, to 34.9 per cent, Oct. 1, 1930. The percentage of tire dealers selling gasoline remained fairly constant, 74.5 per cent this year, against 74.1 per cent last, but this October 65.3 per cent of dealers reported selling batteries, against 59.7 per cent last year.

Reports received from seven chain-store organizations showed total stocks of 473,070 casings and 424,801 inner tubes Oct. 1, 1930. Stock held by the principal mail-order houses was not included, nor stocks in stores operated by tire-manufacturing companies. While comparable statistics for previous surveys are not available, the Rubber Division believes that these figures reflect the growing importance of chain stores in retail tire distribution.

Checker Has New Cab

NEW YORK, Nov. 24—Checker Cab Mfg. Co. has introduced a new cab to the New York market which will be sold to independents and fleet operators as well as to various units of the Parmelee Transportation system, which is now affiliated with the Checker.

The new cab is somewhat shorter than most existing cabs but is designed to give ample room for five passengers and at the same time provide comfortable quarters for the driver.

Russell Managers Meet

NEW YORK, Nov. 24—Russell Mfg. Co., Middletown, Conn., held a meeting of division managers from all over the United States on Nov. 22. Managers from San Francisco, Dallas, Chicago, Detroit, New York and Atlanta were present.

Value of 1929 Automotive Products Increased 34.1 Per Cent Over 1927, Census Bureau Finds

WASHINGTON, Nov. 24—Motor vehicles and trailers shipped last year by American factories were valued at $3,415,636,810, an increase of 34.1 per cent and a new high record, as compared with $2,546,807,058 reported for 1927, the last preceding census of manufacturers year. In addition, the value of parts, accessories, etc., reported by these establishments amounted to $502,359,743, making a total output of $3,717,996,553, an increase of 30.5 per cent over the 1927 total of $2,848,442,843.

Last year's output of motor vehicles and trailers was made up as follows: 4,432,242 passenger vehicles, including chassis, valued at $2,793,166,812; 26,004 public conveyances, $58,127,237; 1910 government vehicles (Federal, state, county and municipal), etc., $9,875,467; 827,318 commercial vehicles, $544,415,348; 21,055 trailers, $10,051,946. The passenger vehicles reported for 1929 comprised 3,911,547 closed cars, valued at $2,530,714,189; 444,686 open cars, $230,275,298; 76,009 chassis, $32,177,425.

The figures for closed cars represent increases of 62.4 per cent and 31.9 per cent, respectively, as compared with 2,408,148, valued at $1,918,057,677, reported for 1927; and those for open cars represent increases of 8.7 per cent and four-tenths of one per cent, respectively, as compared with 409,158, valued at $229,405,033, reported for 1927.

In this connection it should be remembered that the foregoing figures relate only to manufacturers whose principal products are complete motor vehicles and trailers, and do not include the products of establishments engaged primarily in the manufacture of bodies, parts and accessories. For census purposes, the assembling plant is considered as a manufacturing establishment and therefore the number of establishments shown is much in excess of the actual number of manufacturers.

Preliminary census figures show that the establishments engaged primarily in the manufacture of motor vehicles and trailers last year gave employment to 225,583 wage earners and paid $365,660,895 in wages, as compared with 187,910 wage earners and $321,664,093 wages for 1927, representing increases of 20 per cent and 13.7 per cent, respectively.

Canadian Values Higher

OTTAWA, Nov. 22—The value of automobile production in Canada in 1929 soared 10 per cent to a new high value of $177,315,593 and compares with $168,867,000 in 1928 and $128,700,000 in 1927. On the basis of number of cars produced, output increased 9 per cent to 262,625 units.

One feature of the industry last year was the growth in the number of plants, there being 14 plants under operation of 11 companies in 1928, and this had advanced to 12 companies operating 17 plants in the following year, 11 being located in Ontario, 2 in Quebec, 1 in Manitoba, 1 in Saskatchewan and 2 in British Columbia. The total capacity of the plants is estimated at 334,611 cars and 63,579 trucks, while the invested capital amounted to $98,378,301 as compared with $87,056,238 in the previous year.

An interesting commentary on the above figures is the actual production during 1929. From the above figures it will be seen that the total average production per month was 33,182 units, whereas during the first seven months of 1930 the average monthly production was only 17,151 units, which indicates that Canadian plants have been operating at 52 per cent of capacity this year to date, and compares with operations at 66 per cent of rated capacity last year.

There were 204,967 cars made available for use last year while 87,152 cars were scrapped or withdrawn from use. Export shipments during the year amounted to 102,382 cars valued at $45,169,591 as compared with 79,855 cars worth $34,400,967 in the previous year.

Imports during the year under review amounted to 44,724, valued at $39,423,134, as compared with the 1928 total of 47,408 cars valued at 40,832,876. Parts imported in 1929 were valued at $44,772,091 as against $48,839,955 in 1928.

Production in 1929 included 34,744 open passenger cars, 153,877 closed passenger models, 50,293 trucks and 23,611 chassis. Including chassis, the total production for passenger purposes was 203,307, including 94,027 four-cylinder type, 108,344 six-cylinder and 936 eight-cylinder cars.

Manufactures Car Heater

SUPERIOR, WIS., Nov. 24—The Superior Auto Heater Co. has been organized by Irvin Crandalla, Thomas Dodd and Dr. Arthur C. Emerson, to manufacture a newly designed heater for closed cars. It is made of aluminum and operates from the exhaust manifold and has an electric motor blower. At present the production is being handled by local foundries and machine shops. The Northwestern Motor Supply Co., Superior, is handling the distribution.

Chicago Dealers to Hear Blees

CHICAGO, Nov. 24—W. A. Blees, vice-president in charge of sales for Oakland, will discuss distribution and sales problems at a meeting of the Chicago Automobile Trade Association, Dec. 12.

Marmon Plans 1931 Program

Will Have 2 Lines in Addition to 16-Cylinder Model

INDIANAPOLIS, Nov. 29—An outline of the 1931 program of the Marmon Motor Car Co., which included the introduction of a 200-hp. 16-cylinder car engineered by Howard C. Marmon and designed by Walter Dorwin Teague, has been made public by G. M. Williams, Marmon president.

The new Marmon Sixteen will be formally presented to the automotive world at the New York show, and at other principal automotive displays. Colonel Marmon, vice-president in charge of engineering of the company which bears his family name, has spent more than four years in the development of the engine.

In addition to the new sixteen, Marmon in 1931 will begin its fifth year in the eight-cylinder field with two new lines of eights, improved and refined in appearance and performance. One of these will sell in the field below $2,500 and the other will continue Marmon's activity in the $1,000 field.

Oklahoma Revenue Sets New Record

OKLAHOMA CITY, Nov. 24—According to a report made by Homer V. Bird, state gasoline tax collector, collections for gasoline tax during the 1929-30 fiscal year totaling $12,070,630 probably will amount to more than collections from that source for any of the next several fiscal years.

The revenue for that year exceeded the 1928-29 revenue by approximately $3,500,000. This was due to the fact that the four cents per gallon gasoline tax law was adopted and became effective in July, 1929, while the exemption feature did not become effective until the following October and was not in general use until the spring of this year.

"I am sure that collections for the calendar year will not reach the $12,000,000 mark," Mr. Bird said.

Rubber Consumption Rises

NEW YORK, Nov. 24—Crude rubber consumption in the United States for the month of October was 27,271 long tons, an increase over September of eight per cent, according to the Rubber Manufacturers Association.

Imports during the month amounted to 43,729 long tons, as compared with 39,467 in September and 43,725 for October of last year.

Stocks on hand at the end of October are placed at 184,701 long tons, an increase of over nine per cent over September, and compares with 88,483 long tons a year ago.

Crude rubber afloat for United States ports on October 31 was placed at 51,122 long tons.

October Output Totaled 150,044

Factory Sales at Lowest Since Last December

WASHINGTON, Nov. 28—Totaling 150,044 units, factory sales of motor vehicles in the United States in October were the lowest since last December with a total of 120,007, according to the Bureau of the Census. Compared with September of the present year, the decline was 66,833 vehicles. October sales consisted of 112,209 passenger cars, 37,244 trucks and 591 taxicabs, comparing with 175,311 passenger cars, 41,157 trucks and 409 taxicabs in September.

In the 10 months ended with October, motor vehicle sales totaled 3,071,869 as against 5,020,840 in the corresponding period of last year. The 1930 sales consisted of 2,592,022 passenger cars, 473,834 trucks and 6013 taxicabs in the first 10 months of last year.

Canadian sales in October were 4541 units, consisting of 3206 passenger cars and 1335 trucks. September sales were 7957 units, made up of 5623 passenger cars and 2334 trucks. In the first 10 months of 1930 Canadian sales totaled 143,163 vehicles as against 248,376 in the corresponding period of 1929.

Labor Bureau Reports Factory Turnover Rates

WASHINGTON, Nov. 24—Labor turnover experience for all automobile plants in the United States, during the calendar month of October, shows an average separation rate of 3.38 for all establishments reporting, and an average accession rate of 2.10, based on percentages of number of employees on the payroll for the month according to the Bureau of Labor Statistics. This compares with an average separation rate for all industries of 2.36, for October, and an average accession rate of 1.49.

Placing the October figures for the automobile plants for October on an equivalent annual basis shows a separation rate of 39.8, against an accession rate (including new employees and those rehired) of 24.7. The October separation rate for the automobile plants is a composite of the following figures: quit rate, .70; discharge rate, .08, and lay-off rate, 2.60. On the annual basis, the lay-off rate appears as 30.6 for the automobile industry.

Met. Section Hears Kent

NEW YORK, Nov. 24—Modern traffic congestion demands modern parking facilities within easy reach of business sections, Milton A. Kent, president of Kent Garage Companies, told members of the Metropolitan Section, S.A.E., at their regular monthly meeting last week.

Increased Federal Aid Road Appropriations Cited by MacDonald in Annual Progress Report

WASHINGTON, Nov. 29—Increase by Congress at the last session of the Federal-Aid road appropriation to $125,000,000 annually for the years 1931-1933 was met by the states with an increase in the allotments on definite projects to $102,498,084, as compared with $70,428,896 appropriated during the fiscal year 1929, according to the annual report of Thomas H. MacDonald, chief of the Bureau of Public Roads, which Secretary of Agriculture Hyde will make public tomorrow.

During the fiscal year, ending June 30, the 48 states and Hawaii, in cooperation with the Federal government, completed improvements on 9349 miles of Federal-Aid highways (which includes bridges and their approaches), says Mr. MacDonald. At the close of the year, these agencies also had in process of improvement with Federal funds another 9915 miles of highways. Federal funds disbursed during the year on all active road and bridge projects amounted to $75,880,863, about $6,200,000 less than for 1929.

The mileage improved with Federal-Aid in 1930 was lower than in any year since 1924. "The decline was anticipated," says the report, "and is the natural result of the contraction of the program to a $75,000,000 basis, necessitated by the authorization of that annual sum for several years and the final absorption of the unobligated balance of funds apropriated for the earlier years." With the Federal-Aid authorizations increased to $125,000,000 for each of the three ensuing years, a corresponding yearly increase in improved mileage over the 1930 figure is expected by the Federal authorities.

Total Cost, Federal Aid and Mileage of Federal-Aid Roads, Initial and Stage Construction, Completed During the Fiscal Year 1930

State	Total Cost	Federal Aid	Mileage		
			Initial	Stage	Total
Alabama	$3,073,848.12	$1,443,082.40	194.2	14.5	208.7
Arizona	1,535,443.88	1,379,714.19	43.1	46.6	89.7
Arkansas	3,401,174.82	1,685,445.48	102.6	14.3	116.9
California	11,396,353.24	5,087,674.79	335.6	20.0	355.6
Colorado	1,883,264.93	994,769.96	72.3	38.1	110.4
Connecticut	770,370.16	255,295.83	14.1	...	14.1
Delaware	835,954.86	406,222.78	45.2	...	45.2
Florida	1,381,290.93	596,942.17	54.3	...	54.3
Georgia	2,910,553.68	1,230,736.17	134.5	41.4	175.9
Idaho	937,768.62	565,258.96	77.1	...	77.1
Illinois	5,021,954.42	2,201,666.48	169.0	...	169.0
Indiana	6,693,965.53	3,142,358.52	214.7	...	214.7
Iowa	5,075,345.20	2,411,131.90	66.8	146.6	213.4
Kansas	4,022,635.69	1,838,127.19	324.3	16.9	341.2
Kentucky	3,182,683.33	1,522,746.58	218.9	35.3	254.2
Louisiana	739,997.12	330,765.30	46.7	...	46.7
Maine	1,897,734.54	684,782.89	54.3	...	54.3
Maryland	947,200.70	457,092.20	34.1	14.7	48.8
Massachusetts	4,258,302.47	1,427,414.17	89.6	.7	90.3
Michigan	7,779,534.69	3,020,745.34	172.4	2.9	175.3
Minnesota	4,573,620.24	1,786,351.44	242.5	82.8	325.3
Mississippi	3,178,703.45	1,550,795.82	155.2	4.4	159.6
Missouri	10,177,544.47	4,125,021.08	217.0	138.8	355.8
Montana	2,557,945.61	1,565,807.28	214.1	4.1	218.2
Nebraska	2,280,225.35	1,078,362.13	137.8	161.4	299.2
Nevada	1,494,392.50	1,312,039.17	147.3	191.9	339.2
New Hampshire	683,180.62	289,036.37	19.0	1.0	20.0
New Jersey	3,757,925.87	677,880.00	45.1	...	45.1
New Mexico	1,331,927.95	838,102.84	87.5	.7	88.2
New York	12,240,775.13	4,431,341.77	306.9	...	306.9
North Carolina	1,694,550.53	798,658.46	90.8	9.5	100.3
North Dakota	3,931,493.45	1,630,756.04	577.2	392.5	969.7
Ohio	7,966,093.72	3,298,783.47	217.8	...	217.8
Oklahoma	3,764,985.03	1,697,687.86	119.3	59.1	178.4
Oregon	1,129,094.63	597,022.73	87.9	...	87.9
Pennsylvania	15,902,008.93	4,439,697.96	274.3	...	274.3
Rhode Island	910,987.88	326,666.13	19.5	...	19.5
South Carolina	3,511,295.63	1,016,308.31	98.9	45.0	143.9
South Dakota	1,594,466.64	852,372.53	243.1	42.2	285.3
Tennessee	3,088,719.17	1,443,055.24	125.2	...	125.2
Texas	16,492,620.38	7,347,398.73	636.0	368.1	1,004.1
Utah	1,754,707.02	1,138,237.82	73.7	...	73.7
Vermont	1,465,991.89	497,157.48	29.4	...	29.4
Virginia	3,984,741.95	1,627,334.71	137.3	21.7	159.0
Washington	4,176,691.12	1,493,032.99	101.0	10.4	111.5
West Virginia	1,968,983.06	744,716.04	39.0	17.6	56.6
Wisconsin	9,029,204.63	4,154,568.49	288.6	31.7	320.3
Wyoming	1,154,162.71	693,363.60	120.4	36.3	156.7
Hawaii	105,732.15	25,227.00	1.7	...	1.7
Total	$193,648,148.64	$82,158,756.79	7,317.4	2,011.2	9,328.6

U.S. Rubber Changes Its Dealer Policies

Larger Gross Profit Immediately is Plan

DETROIT, Nov. 24—A policy of giving dealers a larger gross profit, through immediate discount rather than bonus after a certain volume has been sold, was adopted by the United States Rubber Co. at its convention of district managers in Detroit on Oct. 27-30.

Another feature which came as a sequel of the conference was the announcement that a uniform accounting system for dealers, designed to simplify and inject greater economy into their businesses, would be presented to U. S. dealers Jan. 1.

Paralleling this scheduled systematizing in the selling organization, the general offices in Detroit have been reorganized. They have been consolidated into five major departments, as follows: operating, in charge of J. C. Ray; automobile and truck tire sales, in charge of H. N. Hawkes; advertising in charge of G. N. Walker; airplane, bicycle and sundries, in charge of A. K. Dill; special brand automobile tires, in charge of Page Noll.

Ohio Sales Indicate Drop

COLUMBUS, OHIO, Nov. 24—Sales of passenger cars in nine of the most populous counties in Ohio during October showed a still further decline from the former month, according to figures compiled by the Ohio Council, National Automobile Dealers' Association. In the nine counties representing more than 60 per cent of the state's population, there were 4275 passenger cars registered in October, compared with 5450 in September and 6858 in August.

Suggest Underground Parking

DETROIT, Nov. 24—Suggestion and plans for municipal construction of four underground parking garages in the city's congested area at a cost of $7,500,000 are being presented to Detroit councilmen by Mechanical Handling Systems, Inc. The garages, municipally owned and operated, would each accommodate from 3000 to 4500 cars. Suggest locations are under Cadillac Square, Washington Boulevard and Grand Circus Park and Madison Avenue.

Service Association Meets

NEW YORK, Nov. 24—Fleet maintenance was the subject of the regular monthly meeting of the Automotive Service Association of New York held here last week. A. G. W. Brown, vice-president of the association and superintendent of motor vehicles for Borden Farm Products Co., presided because of his association with fleet operation.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Brussels, Belgium, Automobile...Dec. 6-17
Sioux City, Iowa, Automobile...Dec. 18-20
New York, National Automobile..Jan. 3-10
National Roadbuilders' Show and Convention, St. Louis .....Jan. 10-16
Buffalo, N. Y., Automobile.....Jan. 10-17
Newark, N. J., Automobile.....Jan. 10-17
Milwaukee, Wis., Automobile ..Jan. 10-18
Cincinnati, Automobile .....Jan. 11-17
Baltimore, Automobile .....Jan. 17-24
Boston, Automobile .....Jan. 17-24
Hartford, Conn., Automobile ..Jan. 17-24
Montreal, Automobile .....Jan. 17-24
Detroit, Mich., Automobile.....Jan. 17-24
Pittsburgh, Pa., Automobile ...Jan. 17-24
Louisville, Automobile .....Jan. 19-24
Omaha, Neb., Automobile.....Jan. 19-24
Rochester, Automobile .....Jan. 19-24
Washington, D. C., Automobile..Jan. 24-31
Chicago, National Automobile...Jan. 24-31
Cleveland, Ohio, Automobile....Jan. 24-31
Los Angeles, Calif., Automobile, Jan. 24-Feb. 1
Portland, Me., Automobile .....Jan. 26-31
Springfield, Mass., Automobile..Jan. 26-31
Syracuse, N. Y., Automobile....Jan. 26-31
Minneapolis, Minn., Automobile..Feb. 1-8
San Francisco, Calif., Automobile, Feb. 1-8
St. Paul, Minn. (Joint show with Minneapolis) .....Feb. 1-8
Scranton, Pa., Automobile .....Feb. 2-7
St. Louis, Mo., Automobile.....Feb. 2-7
Camden, N. J., Automobile, Feb. 25-March 2
Denver, Automobile .....Feb. 9-14
St. Petersburg, Fla., Automobile.Feb. 9-14
Mankato, Minn., Automobile ...Feb. 11-14
Peoria, Ill., Automobile.....Feb. 11-15
Rapid City, S. D., Automobile..Feb. 12-16
Indianapolis, Ind., Automobile..Feb. 14-19
Providence, R. I., Automobile...Feb. 14-21
Quebec, Automobile .....Feb. 21-28
Des Moines, Automobile .....Feb. 23-28
Seattle, Wash., Automobile, Feb. 24-Mar. 1
International Garage Exposition, Berlin, Germany .....May 9-Aug. 9

CONVENTIONS

Annual Asphalt Paving Conference, Memphis, Tenn. .....Dec. 1-5
American Society Mechanical Engineers, Annual, New York City, Dec. 1-5
National Power and Mechanical Engineering Exposition, New York City .....Dec. 1-6
Motor Truck Asso. of America, New York City, ...Dec. 10
First International Aerial Safety Congress, Paris, France .....Dec. 10-23
American Management Asso. (Shop Methods Division), Pittsburgh, Pa. Dec. 11-12
Highway Research Board, Washington .....Dec. 11-12
National Research Council, Washington, D. C. .....Dec. 11-12
Motorcycle & Allied Trades Asso., Annual, New York City .....Jan. 7
Society of Automotive Engineers, Annual Dinner, New York .....Jan. 8
Society of Automotive Engineers, Annual Meeting, Detroit....Jan. 19-23
Natl. Association of Engine & Boat Manufacturers, New York City, Jan. 23
Natl. Paving Brick Mfg. Association, Pittsburgh, Pa. .....Feb. 4-6
A. S. M. E. Fuels Meeting, Chicago, Feb. 11-13
Society for Steel Treating (National Western Metal and Machinery Exposition), San Francisco..Feb. 16-20
Road Show and School, Wichita, Feb. 24-27
American Chemical Society, Indianapolis, Ind. .....March 30-April 4
U. S. Chamber of Commerce, Atlantic City ... ...April 28-May 1

SALONS

New York, Commodore Hotel, Nov. 30-Dec. 6
Brussels, Belgium, Salon.....Dec. 6-17
Los Angeles, Calif., Biltmore, Hotel, Feb. 7-14
San Francisco, Calif., Palace Hotel, Feb. 21-28

NOTE: New York and Chicago Show Weeks' Events are listed on page 813 of the News Section.

LaFrance-Republic Introduces 2 Models

Heavy-Duty Types Replace Three Previous Lines

ALMA, MICH., Nov. 24—The LaFrance-Republic Corp. is offering two new heavy duty models incorporating many new improvements in design and appearance as replacements for three former models. Model M2, designed for road construction and snow removal and straight rated at 20,000 lb., replaces the former M1; Model H2, replacing Models H1 and L1, is straight rated at 15,000 lb.

Both models are equipped with six-cylinder engines mounted in unit with Fuller clutches and transmissions, four-wheel hydraulic operated and vacuum amplified brakes and 8-in. pressed steel frames.

Model M2 is powered by a Waukesha 4⅜ x 5⅛ in. six, developing 96 hp. at 2000 r.p.m., mounted in unit with a 5-speed gearset. A 7-speed dual case transmission can be furnished at extra cost. The rear is a Wisconsin, double reduction, full floating axle with a 6.8 to 1 ratio. In Model H2, a six-cylinder 3⅞ x 5-in. Lycoming engine is employed unit mounted with a 4-speed Fuller transmission. Five-speed gearsets are available at extra cost. The rear is full floating spiral bevel drive Timken, giving a final reduction of 6/14 to 1.

Hug Adds Model

HIGHLAND, ILL., Nov. 24—Model 85-D is the designation of the latest addition to the Hug line. Specially designed for dirt moving and excavation work, this new unit is equipped with a three-yard power hoist body with reinforced sides and tail gate.

The engine is a 4 x 5¼-in. four-cylinder Buda, Model KDUI and the transmission a five-speed Brown-Lipe Model 51. Other features of the model are heavy duty full-floating type double reduction rear axle, 34 x 7 in. single front and dual rear pneumatic tires, Budd wheels and triple compensating Hug rear spring construction.

Gasoline Stocks Increase

NEW YORK, Nov. 24—Gasoline stocks at refineries increased from 37,012,000 bbl. for the week ending Nov. 8 to 37,263,000 bbl. for the week ending Nov. 15, according to the weekly bulletin of the American Petroleum Institute. No comparable figures for stocks at the same period of last year are available.

Victor Places Copper Order

CHICAGO, Nov. 24—Victor Mfg. & Gasket Co. has closed an order for 7,500,000 lb. of rolled sheet copper for current and immediate future requirements.